

Beard (Geo. M.)

**Publishers' Advance Sheets of**  
OUR  
**HOME PHYSICIAN:**

A NEW AND POPULAR GUIDE

TO THE

**ART OF PRESERVING HEALTH AND TREATING DISEASE;**

WITH PLAIN ADVICE FOR ALL THE

**MEDICAL AND SURGICAL EMERGENCIES OF THE FAMILY.**

CONTAINING CLEAR DESCRIPTIONS OF THE

Structure and Functions of the Human Body; the Influence of Occupation on Health and Longevity; the laws of Inheritance; with new and original chapters on Diet, Stimulants and Narcotics, Air, Sunlight, Exercise, Climate, Electricity, and Nervous Diseases of modern times; and full directions for the care of the Sick, and the management of Infants and Children; with a general description of recent Medical Discoveries and Improvements; plain suggestions for the Treatment of Diseases adapted to the wants of the Household, and for those who, like Miners, Sailors, Planters, and dwellers in remote districts, are beyond the ready call of a Physician.

BASED ON THE MOST RECENT AND THE HIGHEST AUTHORITIES IN THE SEVERAL DEPARTMENTS, AND BROUGHT DOWN TO THE LATEST DATES.

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## PREFACE.

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THE objects of this book are :

1. *To prevent disease*, by presenting in a popular form information concerning the laws of health.

2. *To shorten disease*, by enforcing the necessity and the duty of taking bad symptoms in time, and stopping the beginnings of evil.

3. *To diminish the evil and fatal effects of disease*, by giving plain advice for all the medical and surgical emergencies of the family, and simple rules for arresting and controlling disease for those who are beyond the ready call of a physician. Its purpose, therefore, is not so much to enable its readers to dispense with a physician, as to teach them how to dispense with *disease*.

4. *To give popular information concerning the progress of medical science*, by briefly describing and illustrating the recent inventions, discoveries, and improvements by means of which physicians are now enabled to study and to treat disease so much more satisfactorily and successfully than in former times. Although many of the instruments and appliances that are represented cannot, of course, be seen by my readers, and may indeed never be seen by them, yet a general knowledge of their nature and uses cannot fail to be both interesting and valuable to the afflicted of every class, and should have the effect to convince the most sceptical that a profession which has done so much and so nobly for humanity is worthy of the highest respect and most fervent gratitude.

What is here said concerning the structure of the human body and the functions of its organs; on diet, stimulants, narcotics, air, sunlight, exercise, bathing; on the care of the sick-room, the management of infants and children; on the general laws and history of disease; and on the treatment of accidents and emergencies, and descriptions of familiar remedies,—is *designed for all persons and for every household*.

What is here said concerning the special care and treatment of obscure and grave diseases, and the application of powerful remedies, is designed chiefly for those who, like planters, miners, sailors, travellers, and dwellers in remote districts and on the plains,

are beyond the reach of skilful medical aid, and must either be treated by themselves or by their friends, or left to suffer, and perhaps to die.

The work, as now arranged, *not only includes all that has ever been attempted in similar works*, but also *several hundred new subjects in the department of health that have never before been mentioned in any or all of the popular treatises on medical science that have yet appeared*. I have sought to mention and describe every recent medical discovery and improvement that can possibly be of any service to my readers. I have endeavored throughout the work to keep in mind that I was writing for the great masses of the people, who know little or nothing of medical language. Therefore I have aimed to make the descriptions brief, clear, and elementary. There are many methods of studying disease, many hard terms which would only bewilder the general reader, though they are very familiar to physicians. Of such I make no mention.

My aim has also been to make the work so clear that the wayfar-  
ing man might not err therein, and yet so thorough and exhaustive that the educated physician should find in it much to perfect his knowledge and refresh his memory.

It will be seen that the types, phases, and names of diseases have changed wonderfully during the past twenty-five years. We now have less of fevers and inflammation, and more of dyspepsia, neuralgia, hysteria, hypochondria, and other forms of nervous disease.

In our method of treatment, a greater revolution has been wrought than in the types of disease. Instead of bleeding and calomel, tartar-emetic and low diet, we now give *tonics and stimulants—iron and quinine, strychnine and arsenic, cod-liver oil and whiskey, air and sunlight, passive movements, general electrization, abundance of sleep, and a large and palatable variety of nourishing food*.

The result of all this scientific progress is, that we are much more successful in the treatment of diseases than formerly. Consumption is now much oftener held in check, relieved, and cured than it was twenty-five years ago. Statistics now show that it is much less frequently fatal under the new system of treatment than under the old. *Catarrh of the nose and larynx (rhinitis, pharyngitis, and laryngitis), dyspepsia, neuralgia, hysteria, hypochondria, insanity, the special diseases of women, affections of the eye, the ear, and the skin*—all of which were until recently ignored and neglected by the profession—are now treated with signal success. Among the new remedies and methods of treatment that have been found most



successful, I may here mention *bromide of potassium, carbolic acid, the sulphites and hypophosphites of soda, pepsin, cod-liver oil, strychnine, Swedish movements, general and localized electrization, podophyllin, pyrophosphate of iron, veratrum viride, nitrous oxide, oxygen, phosphorus, glycerine, chlorate of potash.*

This work is intended to be a *compend of the whole of the popular medical science of our time*, so far as it can be interesting or useful to my readers. Under Anatomy I have presented those general facts in regard to the structure of the body, that every one, young and old, should be acquainted with. Under Physiology I have introduced many recent experiments and researches in this most fascinating branch of science. Under Hygiene I have given in detail important rules for the care of the health and the art of prolonging life. This is a subject to which I have devoted my life, and one to which I call the special attention of my readers. The large portion of the book devoted to the care of the health will be found to contain new, reliable, and interesting facts, many of which have never before been published. The facts and views that I present on the subject of *Food, Stimulants and Narcotics, Exercise, Sleep, Laws of Inheritance, Influence of Occupation on Health and Longevity, Man compared with other Animals*, certain of the nervous diseases, will probably take most of my readers by surprise. This surprise will be all the greater because the people have usually obtained their instruction on these matters from bad or ignorant men, who knew nothing whatever of science. I have tried also to present this department of hygiene in a somewhat attractive and interesting style, so that every one into whose hands the book may fall will read them *first*, even though all other sections are neglected.

In speaking of the various Accidents, Diseases, and Remedies, I have aimed to be brief, clear, direct, and explicit; to introduce nothing that would mislead, to omit nothing that can be of practical service to any one. I have tried to draw the lines beyond which patients should never attempt to cross. I have pointed out those conditions in which patients should never allow themselves to be treated by themselves or their friends, and should consult the best medical advice or none at all.

It will be seen that a large number of diseases which the masses of the people suppose to be incurable are now, under our modern systems of treatment and in skilful hands, susceptible of relief and of cure. All over the land there are thousands of cases of cataract that a skilful oculist might operate on with success; thousands of cases of deafness which, if taken in time, might be wholly or partially cured; thousands of cases of dyspepsia, neuralgia, paralysis,

and other nameless forms of chronic nervous diseases, that, if they only knew where to go, without falling into the hands of the philistines, might be permanently relieved. All about us there are aching heads, weary nerves, that cry bitterly for relief and know not where to find it. This knowledge of the best way to consult a physician, and the best means of treatment, especially for diseases that have been regarded as incurable, I endeavor here to supply.

There are yet among the people those who have a blind faith in some one school or exclusive system of treatment. *To all such, let me say that the wise physician of our time uses for his patients all things that have been proved to be beneficial. On this principle this work is based.* The best physicians of our day are not narrow or bigoted, as some suppose, but are on the whole more liberal and progressive than almost any other class in society.

I undertake the enterprise with a full appreciation of the responsibilities of my position as a pioneer. Accordingly, I have left no stone unturned to make the work fully represent the best and most recent opinions and experience of the leading authorities of our time in the various departments.

This book, as now completed, is the work of so many hands, that I might perhaps be more properly called its editor than its author. Of the "*Domestic Medicine*" prepared by Imray and other able writers, on which the work is based, I have taken of the general descriptions, especially in the department of Anatomy, such portions as in their very nature cannot be very progressive, and are therefore of permanent application.

I have been assisted in the department of the *Eye and Ear*, by Prof. D. B. St. John Roosa; in *Surgical Accidents and Emergencies*, by Prof. Benjamin Howard; in *Obstetrics and the Hygiene of Infancy*, by Dr. James B. Hunter. In the general revision of the work and correction of the proofs I have received indispensable assistance from my professional associate, Dr. A. D. Rockwell.

In collecting *Vital Statistics* I have at various times received invaluable suggestions from those eminent hygienists, Dr. Edward Jarvis and Dr. Elisha Harris, Registrar of Vital Statistics of the New York Metropolitan Board of Health.

In the *sanitary department* I have had the benefit of the experience of the well-known sanitarian, Dr. John H. Griscom.

To each and all of these gentlemen I desire to express my warmest acknowledgments, not alone for special assistance, but for general encouragement in my labors.

I have quoted extensively from my translation of *Tobold's Chronic Diseases of the Larynx*, from my works on *The Brain and*



*Brain-Workers*, and *Hygiene for Students*, both of which are now being prepared for early publication; and also from a work on *General and Localized Electrization*, by Dr. A. D. Rockwell and myself, which is now in press. To Messrs. Tiemann & Co. my thanks are due for courtesy and promptness in furnishing a number of the cuts of instruments with which the work is illustrated.

I have consulted and freely quoted the standard works in the special departments of medical science that have appeared during the last few years. A partial list of the more prominent of these writers, with the titles of their books, will be found under a separate heading.

The task which I have here undertaken is one of unusual difficulty and delicacy. To prepare a comprehensive popular treatise on the recondite science of medicine that shall say just enough to instruct, and not so much as to bewilder; that shall fairly represent the various departments in language both clear and attractive, as well as accurate and instructive; that shall make broad and plain the boundaries between those subjects which the people can and should know, and those which they should not attempt to know; that shall treat all this large variety of themes in such manner as not to offend the taste of the best-ordered household,—this is probably the severest test to which a scientific writer can possibly be brought.

In the absence of any respectable model, I have been compelled to proceed without guide or precedent, and to create my own ideal. Accordingly, it has been my aim to write here in the pages of this book just what I say every day in my office to my patients; just what I have been accustomed to teach in my popular essays and in my lectures before schools and lyceums.

I say just what the family physician would tell his patients if he had the time and strength to give instruction in science to the families under his charge.

NEW YORK, August, 1869.

G. M. B.

# INTRODUCTION.

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## I.

### REASONS WHY ALL PEOPLE SHOULD HAVE SOME GENERAL KNOWLEDGE OF MEDICAL SCIENCE.

It is one of the most cheering signs of our times that *science* is being diffused among the masses of the people.

On every hand we see evidences of an increasing love for scientific truth, even among those classes who formerly had no love for knowledge of any kind. Works on familiar science are now read with considerable eagerness; and the certain prospect is, that in a few years they will command a much wider circle of readers than they do at the present time.

The people are beginning to learn that science is for them and not for the few, and are now informing themselves of some of the general principles and facts of astronomy, of geology, and of chemistry; and our periodical literature is helping on the good work, oftentimes unconsciously. It is hard to find any prominent and popular newspaper or magazine that does not now and then present some interesting and valuable scientific facts and theories; and there are quite a number of journals which regularly devote a certain space to popular science in all its branches—chemistry, astronomy, geology, and medicine.

Nor is this all. Quite recently a journal has been established, one of the professed objects of which is to disseminate popular science among those classes who are the most eager readers of fiction.

These signs of the times are, I say, full of cheer. They give promise of a more generous culture, larger views, and more kindly tolerance in the future, among all ranks of society; for the tendency of scientific knowledge is always to liberalize.

The one great cause of the prevailing (but happily diminishing) narrowness in our current theologies, systems of education, and social customs, is *ignorance*. Ignorance begets prejudice, and for the poison of prejudice the only antidote is *knowledge*.

While, then, bidding God-speed to all who, like Agassiz, and



Huxley, and Youmans, and others, are endeavoring to popularize natural science, I desire here to make a special plea for the popular study of the *Human Body in health and disease*.

There are reasons why, especially at the present time, every one should make it a pleasure and a duty to become acquainted with some of the general facts in regard to the structure and functions of the human system, as well as the rules for preserving health, and checking or modifying disease.

These reasons are:—

1. *Because the human body is the greatest wonder of creation.* Nothing that man can devise, and nothing else that God has created, is worthy to be compared with the complex, wonderful machine which we call *man*.

A distinguished theologian truly and eloquently says: “Men will cross the ocean to see a mountain or a waterfall, but there is more of grandeur in the human spirit than in all material nature.”

Now the human spirit is manifested through the material organization—the body; it therefore becomes necessary that we should study the structure and functions of this body before we can well and truly understand the spirit of which it is the agent. The human brain, through which the soul is manifested, is a far more wonderful object than the loftiest mountain or the broadest ocean. It is true that the gigantic and imposing objects of nature,—mountains and oceans, forests and cataracts,—appeal more directly to the uneducated senses than do those objects which are comparatively minute and insignificant.

The element of size, the grandeur of immensity, the awfulness of height and depth, of length and breadth, can be much better appreciated by the great mass of unthinking and unreasoning humanity than objects which, though far more wonderful and suggestive, are yet less imposing and pretentious. Humanity the world over is more impressed by quantity than by quality. In proportion, however, as men advance in knowledge, in proportion as reason obtains supremacy over imagination, in that proportion will men cease to be impressed by mere size and quantity, and will learn to appreciate the beauty and grandeur of nature as revealed in objects that to the untaught mind would not only not be impressive, but would actually be revolting.

There are those who feel that the study of material substance is undignified and disagreeable. They declare that the study of anatomy suggests the dissecting-room, that the reading of hygiene tends to hypochondriasis, and that all discourses of medicine bring up horrid images of the hospital and sick-room. To all such objec-

tions I reply that knowledge itself is dignity, and in turn dignifies and ennobles that which to the untutored senses is insignificant and revolting. The human body is always small and insignificant in comparison with thousands of other created objects, animate and inanimate, and only in exceptional cases is it attractive or beautiful to the eye; and yet it is the most wonderful and suggestive of all.

The brain is but a small portion of the human body: its yielding and sightless mass can readily be held in the hollow of the hand; but in comparison with it all other wonderful objects of nature sink into insignificance. Place but a minute section of that brain beneath the microscope, and what before, to the unaided vision, was as simple in its structure as a formless mass of clay, reveals itself as a vast congeries of cells, group after group, layer on layer, of every variety of shape, infinite in their number, infinite in their communications, and infinite, too, as we may suppose, in their functions. Subject a fragment of that brain to the tests of chemistry, and we learn that the elements of which it is composed are substantially similar to those out of which are developed thousands of organized products of nature; and thence we are forced to infer that the vast superiority in function and capacity over all other created objects must be due solely or chiefly to some subtle and mysterious difference of molecular arrangement, which neither the microscope nor chemistry have yet been able to fathom.

2. *A general knowledge of medical science will aid us in preserving health and prolonging life, and thus will add much to our usefulness and happiness.*

The great art in medical science is not so much to cure disease as to prevent it. The great progress that medicine has made in recent times is shown not so much in the actual treatment of disease—although here also we are far more successful than formerly—as in forestalling and preventing it by obedience to the laws of health and wholesome sanitary reform.

For all that we are, and for all that we do in life, we are dependent on the body. The difference between one man and another is the difference in quantity and quality of bodily formation; for the soul manifests itself through the brain, which is an organ of the body, and is as much dependent on the brain for the character of its manifestations as the digestion is dependent on the apparatus of digestion.

Strictly speaking, there can probably be no such thing as a disease of the mind without a corresponding disease of some part of the body, and usually of the brain, which is the organ of the mind. In view of this consideration we see that it becomes a high and



solemn duty for every one to obtain some general knowledge of the human system in health and disease, in order to guard against evil, to ward off injury, to intensify and prolong existence.

It should be remembered that every evil that is experienced by the human system, every pain, every sorrow, every disease, comes by the operations of the great law of cause and effect. Nothing evil or good comes to us by chance. Contagions, epidemics, malarias, the myriad forms of nervous disease, the subtle and saddening phases of insanity and delirium—all these myriad woes of the human races are dependent on definite causes, many of which may be guarded against by those who have the requisite knowledge.

*A general knowledge of medical science will help us to fulfil more intelligently and successfully our various duties as members of society.*

Science must not be confined to scientific men. A knowledge of science in its various departments, and especially a general knowledge of the structure and operations of the human body and of some of the laws of disease, will make us better lawyers, better clergymen, better merchants, better farmers, better laborers, better mechanics and artisans, better wives and mothers and husbands and fathers, better citizens, and better in every condition and relation of society.

*The habit of studying and reading on science is important, not only for the facts that we learn, but on account of the habit which we thereby form of looking at questions from a scientific point of view.* We are all of us too much inclined to form our opinions from prejudice, and from a general impression, without regard to truth or facts. The consequence is that society is filled with error. The consequence is, that even in this enlightened age and throughout this enlightened country, the opinions of masses of people on nearly every important subject are more or less erroneous. On nearly every page of this present work I have been obliged to refute some deeply-rooted, widely-spread error concerning diet, or stimulants and narcotics, or sleep, or exercise, or some form of disease. Erroneous views on medical science confront the physician wherever he turns—in the street, in the store, at public assemblies, in the halls of legislatures and chambers of justice, in the periodical literature and in our standard works of genius, in every family, and by every bedside.

These are not the results of ignorance alone. They are the results of a *deficiency in the scientific spirit*, and an excess of dogmatic prejudices in society.

The *scientific spirit* differs from the dogmatic spirit in these respects :

*First.* In the pursuit of truth it endeavors to dismiss all prejudice, all preconceived impressions. It has no theories to prove and no wishes to gratify, except the love of truth.

*Secondly.* It never ASSUMES that anything is true until it is proved to be true ; and always holds itself ready and willing to change any views, however dear or long-cherished, as soon as they are proved to be erroneous.

*Thirdly.* When it has found the truth on any subject, after careful and patient balancing of all the facts that bear upon it, it eagerly embraces and proclaims that truth, without ever asking for an instant whether its apparent tendencies may be good or evil.

The great want of our country at the present time is a wider diffusion of this scientific spirit, so that men will form their opinions, especially on social and political topics, less by their hopes and desires, expectations and fears, and more by the *facts*.

When I write on the ignorance of the country on matters of science, I know not where to begin or where to end. This ignorance is not confined to the lower classes ; it is even more prominently observed and far more injuriously felt among the educated and influential. In our country this scientific ignorance is especially to be deplored, because here all men are created free and equal, all have equal voice in the administration of government, and all have equal chance to rise to positions of honor and influence. Our present social, legislative, and judicial systems are so defective, that men who know nothing whatever of science are continually called upon to decide important scientific questions affecting the rights, the privileges, and the duties of those who, perhaps, know far more than they, not only of science, but of every other department of thought.

Legislatures, not one of whose members can answer the simplest fundamental question concerning the nature or the history of stimulants and narcotics, who do not know and have not thought to inquire whether they came chiefly into use fifteen hundred years before Christ or fifteen hundred after, are yet every year called upon to enact laws to prohibit or regulate their use in society. Is it surprising that their legislation is so absurd and inconsistent ? Judges and juries, who have not the faintest conception whether insanity is a symptom of disease of the brain or of the liver—who in all their lives have never given five minutes of consecutive thought to any scientific subject whatever—are compelled, under our present system of laws, to decide on this momentous question



of sanity or insanity, not only in cases of life and death, but also in cases where property even, so much more valued than life, is at stake. Is it surprising that the wicked so often escape and the irresponsible are so often punished?

Clergymen, editors, and public teachers, who know all subjects better than they know the science of life, are expected and required to pronounce upon the right or wrong of questions which do not and should not rise into the sphere of morals until they have first been determined in the sphere of experience. Is it surprising that even our most conscientious public instructors must sometimes put darkness for light and light for darkness on many of these important themes?

Parents and guardians, who have never themselves been properly taught concerning the structure or the functions of the human body, are obliged to train up their children to the same dogmas and prejudices and erroneous impressions by which they themselves have been inspired. Is it surprising that our children grow up in error? Would it not indeed be still more surprising if they possessed any true or real knowledge on any question of hygienic or medical science?

The truth is, that there is scarcely any important social, political, or religious question of our time that may not be aided in its solution by a knowledge of the leading principles of medical science. The rights and duties of women, the status of the Africans, the future of the Chinese, and many other analogous questions of minor importance, would be solved much more readily and more correctly if philanthropy would not so blindly refuse the aid of physiology. But, unfortunately for the cause of truth, only those who have at least some general knowledge of medical science, or who have enjoyed some training in that department, are willing to listen to arguments based on the facts of science, especially when they militate against their prejudices and desires. Prof. Goldwin Smith, in his masterly address on education recently delivered at Albany, said that the voice of physiology should be heard on this great question of the education of woman; but until the people, both the leaders and the masses, are educated into a scientific spirit, the efforts of physiology will be vain. Though she cry aloud in every language and on every corner of the street, yet her speech will be in an unknown tongue, and her voice will be drowned in the jeers and groans of the multitude.

It cannot be denied that even at the present time there exists a deeply-seated prejudice against scientific men. They are regarded as the enemies of truth, although their professed object is the pur-

suit of truth. They are branded with meaningless but repulsive epithets,—materialists, infidels, atheists,—and are held up before the people as solemn and impressive warnings. The cure for this unfortunate prejudice lies in the general diffusion of scientific knowledge.

4. *The study of the principles and facts of medical science is exceedingly pleasurable.*

If the pursuit of knowledge is the highest and most enduring pleasure of life, the study of science is the most enjoyable department of knowledge.

The calm and unworried pursuit of science is probably the purest and most enduring intellectual pleasure of which human nature is capable. It is also exceedingly conducive to health. As will be shown in my essay on the Influence of Occupations on Health and Longevity, philosophers and men of science attain a great average longevity.

*Children should be instructed in the interesting and important departments of physiology and hygiene, not only at school, but in the family circle.* It is not right nor necessary that the study of these subjects should be made dry and dismal. By the aid of maps, charts, pictures, attractive books, and especially by the exercise of kindly care on the part of instructors, these theories can be made not only instructive but actually fascinating. The commandments of physiology and hygiene should be taught diligently unto our children, line upon line, precept upon precept, here a little and there a little, in the house and by the way, at their lying down and their rising up. Much of the scientific instruction given to children in early life will not be fully understood in all its transcendent importance until after years; but in time of need they will both remember and appreciate its value.

They will remember it when they rise to positions of responsibility and posts of honor, and will guide their judgment and inspire their lives by its teachings. They will remember it in the hour of temptation, and will derive therefrom wisdom to direct and strength to resist the force of mastering passions. They will remember it in the time of darkness and sorrow, and will rejoice in the light of its truths, and find the rarest of consolation in the activity of its pursuit. They will remember it when they themselves are parents, and in turn will teach it to their children, and they again to their children's children, unto the remotest generations.



## II.

### REASONS WHY THE PROFESSION SHOULD LABOR TO DIFFUSE A GENERAL KNOWLEDGE OF MEDICAL SCIENCE AMONG THE PEOPLE.

THE duty of the profession to diffuse a knowledge of medical science among the people is rendered imperative by these *four* considerations :

1. *Because all people everywhere need, and should have, some general knowledge of the human body in health and disease.*

The time has gone by when it was thought to be necessary that learning should be confined to the few. It is the glory of our century that knowledge of all kinds is diffused among the masses of the people. The time was when theology was confined to the clergy, and was the privilege of monks and cloisters ; religion is now the duty and the joy of the ignorant and the lowly. The time was when all government and law were in the hands of a few aristocrats, and even of some single monarch ; in our day and country the people rule, and kings and queens, presidents and senators, are but their servants.

Science must now follow in the wake of theology and government. If the masses of the people are to have all the power in Church and State, they certainly must not be left in ignorance. For the ignorance of humanity there is only one antidote, and that is knowledge. Of all departments of knowledge, none is so important as that of ourselves. It is impossible to know ourselves without knowing the structure of the human body, the functions of its organs, and the laws of health. It is impossible to acquire this knowledge without careful study, diligent reading and patient repetition, in all the recognized methods of imparting knowledge. It must be taught to children in the school and by the domestic fireside, and in juvenile literature. It must be taught to parents from the pulpit, the platform, and in the periodical press, and in such works as these.

The present ignorance of society in regard to anatomy, physiology, and the laws of health are truly appalling. Even the clergy, who are so advanced in general culture, and who should be the teachers of hygiene as a part of morality, are as a profession utterly in the

dark in regard to the simplest laws of life and health. Theologians and professors, college presidents and pulpit orators, who have learned all important languages, living and dead, who can repeat at call the names of all the imbecile and insane kings of Europe and the dates of their administrations, do not even suspect the nature of the processes of respiration or of digestion every moment going on in their own bodies; and even give no reason for the faith that is in them, that the brain rather than the liver is the organ of the mind.

Even men of general science, who plan great inventions and understand all the machinery of man's devising, know nothing of the most wonderful machine of all—the human body. If these things be done in the green tree, what shall be done in the dry? If our teachers, and the teachers of our teachers, know little or nothing of themselves, what shall we say of the great masses of the people? What shall we say of the millions of farmers, mechanics, laborers, and the solid yeomanry of our land, on whose virtue and intelligence the welfare of the republic must ever depend?

*The profession must exert its influence to introduce the systematic study of hygienic science in all of our colleges and institutions of learning.*

Time was when the standard of scholarship was necessarily estimated by the extent of one's familiarity with dead languages; when the span of a thousand years—the dark ages of humanity—intervened between the scholar in the cloister and the literary wealth of the world; when, in short, the student was forced to choose between treasuring up the learning of ancient times, and knowing nothing at all.

That necessity has long since gone by, but the system of instruction to which it gave rise in its leading features lives to-day. Bacon never uttered a profounder or more beautiful thought than when he said that what is called the antiquity of the world is really its youth. If the ancients could be alive again to-day, they surely would be the first to bow at the feet of the nineteenth century.

When we consider the marvellous scientific progress of the last century—that within that time Geology has arisen out of the darkness of conjecture and has developed into a more comprehensive and enduring science; and that by the discovery of hydrogen by Cavendish, of oxygen by Priestley, of nitrogen by Rutherford, and by the labors of Sir Humphry Davy, Liebig, and their followers, the science of chemistry has been as it were created, and all since the year 1766; that within less than this time that universal agent,



Electricity, has revealed itself to man in its effects if not in its nature,—has indeed deigned to serve him as his fleetest messenger through the air and under the sea, as the faithful and rapid copyist of works of art, as a powerful means of illumination, and as a most effective healer in disease; that within the last fifty years the mechanic arts, in their myriad ramifications, have made more effective progress than other eras have witnessed in twice as many decades; when we consider that astronomy, the most ancient of sciences, the boast of the Egyptians and Chaldeans—which is indeed in its very essence a study of centuries—has not been without its refinements even during the present generation—nay, even within the year that is just passed; when, I say, we thus consider all that the last fifty years has done for science,—and more than all, when we contemplate the wondrous possibilities of the fifty years to come, and for which we now have but laid the foundation; and when, on the other hand, we consider how little these branches are taught or even suggested to our undergraduates, we can but wonder that an age which has revolutionized society by its activity in science, has made so little impression on those institutions that ought to be, if they are not, the centres and the repositories of the world's progress.

It is neither necessary nor desirable that hygienic or other science should supplant the languages. It is the duty of the profession, however, to see that in all our institutions of learning it is placed on the *same footing as all other important departments*; that it receives something more than a merely incidental and superficial attention; and that it is made *equally binding with all other recognized studies of the course*.

2. *Because physicians are the only class who are authorities in medical science, and who are qualified to give instruction in it.*

Medical science is a large subject, and it takes a lifetime to comprehend it. People look to those whose lives are devoted to this subject to teach them what they ought to know. They have a right to do so. Of those to whom much has been given, much will be required. If we know that which will be of service to our fellows, we have no right to keep it to ourselves alone. A miser of knowledge is even more censurable than a miser of money, because he is more intelligent, and therefore more responsible. It is even more wrong for us to hoard knowledge than to hoard specie, for knowledge is more valuable than gold or silver or precious stones.

Until quite recently the clergy have been the chief instructors of the people in medical science; but they have unfortunately taught more of error than of truth. The fault, however, is not with the

clergy but with the physicians. The clergyman must first be himself instructed before he can instruct others. The duty of teaching medical science to the clergy devolves upon the physician, because in all such matters he is the first authority and last appeal. It is right and proper and noble for the pastor to teach his flock the laws of health, and to enjoin their observance as a high moral duty; but he must know whereof he affirms, and the true knowledge on these themes he must learn from the physician.

3. *Because the instruction of the people in medical science has been almost entirely in the hands of ignorant and unprincipled charlatans.*

This lamentable and well-known fact, which ought long since to have aroused the profession to its great duty, seems to have had the opposite effect, and has deterred them from attempting any systematic instruction of the people. There are those even now who fear to write or lecture for the masses, lest they may thereby become classed with the ignorant and villanous quacks who in this country have appropriated this department almost entirely to themselves. I hold to a very different doctrine. I hold that the example of charlatans, so far from discouraging, should rather stimulate the profession to follow after them and drive them off the track. It is because the enemy have planted tares in the field, that we should enter in and sow the good seed. It is because the philistines have already invaded the land, that we should hasten to take possession.

The noblest and best part of our mission is not to cure disease, but to prevent it. The true and only way to prevent disease is to diffuse through all ranks of society a general knowledge of the human body and of the laws of health.

There may be those who fear lest the profession may lose its dignity by coming down from its lofty eminence and feeding the hungry multitude. In the infancy of science, in the darkness of the middle ages, such fear was, perhaps, not unnatural; but the time for that has now long gone by. When the sun is rising it gilds only the higher mountain tops; when it mounts to noonday it sends its rays, bright, warm, and abundant, into the depths of the valleys and the darkest crevices of the rocks. Just so when science was first rising upon the world, its light was only seen and its warmth only felt by the philosopher, the recluse; as it is now ascending higher in the sky, it should shine, with wisdom and healing in its beams, on the walks of the humble, the lowly, and the sorrowing.

Science is no more degraded by ministering to the wants of the people than is the sunlight when it trails its beams along the valleys, or the rain when it falls alike on the evil and the good.



Jean Paul Richter has somewhere presented in substance this simile, which the disciple of science should ever bear in mind: "Beautiful is the eagle when it soars aloft in the sky and plumes its distant flight towards the sun, but more beautiful still when it descends to the earth and brings food to its helpless offspring in their nest; so the philosopher is noble when he lives above the world in the cold atmosphere of science, but nobler still when he descends from his lofty heights and brings hope and comfort to the suffering sons of men."

4. *Because the profession will elevate and benefit itself by thus instructing the people in medical science.*

All physicians the world over will agree that ignorant people make the worst patients. The lower classes are proverbially exacting and unreasonable, and too often unappreciative. In proportion as people are educated—and especially in science—in that proportion do they become considerate towards their physician, obedient to his orders, and grateful for his services.

The effect of the popularization of medical science will be not to diminish the practice of the profession, but to increase it. Patients are deterred from consulting educated physicians, not by knowledge but by ignorance; not by their ability to prevent or treat diseases, but their inability to distinguish between those conditions which are beyond all hope, and those which in scientific hands are both relievable and curable.

When the people are educated to a full understanding of the wonderful achievements of science in the past, and the vast progress that it is making in the present, and the wide distinction between the physician and the quack, then will they know—what the masses of our country have yet to learn—that the educated members of the profession are not the enemies but the friends of advancement, and that on the average they are as much more successful than the charlatans, as they are more scholarly and more honest.

It is only by a general diffusion of popular science that the vast army of charlatans—that are now working such ruinous havoc in the best ranks of society—can be successfully combated and dispersed. The scientific man is pained to his heart's core when he sees—as every day he is compelled to see—the best educated and finest cultured minds of the country—our leaders in literary, professional, and business life—ruined in health and in purse by the vilest quacks that ever disgraced any age or country. The quackery of our day feeds and fattens on the ignorance of the learned. It derives its rich support from the fact that the people know all other things better than they know science. The scientific physi-

cian who long gazes upon this great rush of humanity after quack doctors, quack books, quack medicines—after all forms of error and one-sided “pathies” and “isms,” feels much like the philanthropist who, from the bank of a mighty stream, sees his fellow-beings hurried along in the flood and engulfed in the whirlpool, while he is powerless to save.

Salvation from quackery will only come from popular instruction.

Besides all this, it is the duty of the profession, through the popularization of science, to make itself a *power in society*.

It is our duty in this way to make our influence more widely felt as a ruling force through all the departments of modern activity.

For all these reasons we hail with joy the recent endeavors of some of our leading physicians to popularize medical science. The system of lectures on science lately attempted by Professors Huxley and Carpenter in London; the noble example of Professors Willard Parker and E. R. Peaslee in New York; the recently published essays of Bowditch, Jarvis, Allen, Youmans, Hammond, Flint, Mitchell, Griscom, Peters, Roosa, Harris, Byford, and other leading authorities in our profession; and the magnificent and successful treatise of our eminent countryman, Prof. John C. Dalton—all these are the emphatic protests on the part of the profession that the people shall no longer dwell in darkness, that the medieval age of narrow and selfish exclusiveness has passed away, and that men of science shall hereafter follow in the path of theologians and law-givers, and sow the good seed of truth broadcast through society.

In order to popularize science it is not enough to provide textbooks for the young. We must sow beside all waters. We must make the magazines, the daily and weekly press, the platform, the lecture hall, the organizations of philanthropy, the pulpit and the Sabbath-school, channels of communication, through which knowledge of science shall flow to the uttermost corners of the earth.



or at least is the first symptom of that fatal malady, as well as of many other formidable disorders.

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## STIMULANTS AND NARCOTICS.

The subject of stimulants and narcotics is of so great and increasing importance that it not only deserves a special chapter, but is in fact worthy of an entire volume.

It is proper and necessary that people everywhere, at least in civilized lands, should understand something of the nature of stimulants and narcotics, in order that they may know how to use them and how not to abuse them.

I may say at the outset, that by stimulants and narcotics I mean not only rum and tobacco, but every substance to which the human race have been accustomed to resort for stimulating and narcotizing effects.

There are as many different kinds of stimulants and narcotics as there are different races and tribes and families of men on the face of the earth.

The following list and explanations, though incomplete, will give some idea of the varieties that are now used in different parts of the world. It will be seen that many of these substances are not known here, even by name.

*Fermented and distilled liquors.*—*Rum, gin, brandy, whiskey, champagne, sweet and sour wines, cider and beer*—all contain alcohol, in greater or less quantities. They are used in all civilized and many of the semi-civilized lands, among about 500,000,000 people. In the United States and Great Britain the stronger liquors are used; in France, Germany, Spain, and Italy, the lighter wines.

From Sheen's little treatise I extract the following interesting facts with reference to alcoholic liquors:

"The vine is said to have been introduced into England by the Romans, and vineyards are mentioned in the earliest Saxon charters, as well as gardens and orchards.

"Bede, writing in 731, alluded to vineyards being in existence at that time. Domesday Book also speaks of vineyards in several counties. William of Malmesbury, in his work 'De Pontificibus,' written in 1123, informs us that the vale of Gloucester used to produce as good wine as many of the provinces of France. From the date of the Conquest vineyards appear to have been attached to all the abbeys and monastic institutions in the southern and western

parts of the island. But about the time of the Reformation, when the ecclesiastical gardens were either neglected or destroyed, ale, which had been known in England for many centuries, seems to have superseded the use of wine as a general beverage.

“We have no historical record of the period when the distillation of spirits was first known. The Greeks and the Romans were ignorant of ardent spirits, and, from the absence of any evidence to the contrary, we must assume that the art of distilling was not known until long afterwards.

“The use of the still appears to have been well known in the time of Geber, who lived in the seventh century, and who describes very accurately the process of distillation by the alembics—*per descensori-uno et filtruno*—in his work entitled ‘*Liber Investigationis Magisterii*.’ It has been stated that Albucasis, who is supposed to have lived in the twelfth century, taught the method of procuring spirit from wine; but as the process of distillation was evidently known long before his time, it is equally certain that his predecessors had submitted fermented liquors to this operation. Arnould de Villeneuve, a physician of the thirteenth century, is the first author who speaks explicitly of an intoxicating spirit obtained by the distillation of wine, and he considers it to be the universal *panacea*, so long sought after in vain. His disciple, Raymond Lully, was acquainted with spirit of wine (which he called *aqua ardens*), as well as of the mode of depriving it of water by means of some alkali.

“Morewood considers the Chinese to have been acquainted with this process long before the rest of Asia, Africa, and Europe. In his ‘*Essay on Intoxicating Liquors*,’ page 107, he says: ‘In China, a country which has preserved its civil polity for so many thousand years, the art of distillation was known far beyond the date of any of its authentic records. The period of its introduction into that country, in common with the rise and progress of other chemical arts, is, however, concealed amidst the darkness of ages. But, taking dates as we find them sanctioned by respectable authority, and leaving the assumed antiquity of the nation as a point for the discussion of chronologists, we are certainly led to attribute to the people of this empire the merit of an invention which seems to have eluded the grasp of the human intellect in the rest of Asia, Africa, and Europe, until a more advanced period in the history of the world.’

“The preparation of alcohol may be divided into three stages—the production of a fermented vinous liquor, the preparation from this of an ardent spirit by distillation, and, lastly, rectification or purification. When vegetable substances are placed in contact with



air and moisture they undergo that kind of decomposition which is denominated *fermentation*. The products of this process vary at different periods or stages, and on this depends the distinction into kinds or varieties of fermentations. Thus starchy liquids, under some circumstances, become saccharine, the process being termed the *saccharine* fermentation. Sugar, dissolved in water and mixed with nitrogenous matter, is converted into carbonic acid and alcohol, and to this process the name of vinous fermentation is applied. Under some circumstances mannite, lactic acid, and a syrupy mucilage are formed by the action of the nitrogenous or albuminous principles of vegetable juices on the sugar. This change has been denominated the *viscous* or *mucilaginous* fermentation. Vinous liquids are capable of generating acetic acid, and the process is called *acetous* fermentation. Lastly, most vegetable substances are slowly converted into gases, and a substance called vegetable mould, constituting the process termed the *putrefactive* fermentation. The liquid obtained by the vinous fermentation has received different names, according to the substance from which it is obtained.

“When procured from the fresh juices of fruits, as grapes, currants, gooseberries, &c., it is denominated *wine*; from a decoction of malt and hops, *ale* or *beer*; from the expressed juice of apples, *cider*; that of pears, *perry*; and from a mixture of honey and water, *mead*. Fermented infusions of barley (raw grain and malt prepared by distillers for the production of ardent spirits) are technically termed *washes*.

“*Brewing* consists in the process of extracting a saccharine solution from grain, and in converting that solution into a fermented and sound spirituous beverage called beer or ale. This art, although a perfectly chemical one in nearly all its stages, had not until comparatively lately been indebted to chemistry for any of the improvements which have been made in its details. This we may attribute to the rare occurrence in former days of a practical chemist being engaged in the operation of brewing. However, we find that within the last few years very great additions have been made to our knowledge of this art—particularly in our being acquainted with that principle by means of which the conversion of starch into sugar whilst in the mash-tun is brought about. Various other improvements affecting the mode and appliances as well as the principles of the art of brewing have also been adopted by many of our leading firms, which contribute largely to facilitate their means of production and supply.

“The process usually followed by the brewer may be divided into eight distinct parts independent of malting, namely: first, the

grinding of the malt; secondly, the operation of mashing; thirdly, the boiling; fourthly, the cooling; fifthly, the fermentation; sixthly, the cleansing; seventhly, the racking or vatting; and, eighthly, the fining or clearing. In brewing the various beers, or ale, porter, and stout, three distinct sorts of malt are employed—the pale or amber malt, the brown malt, and the roasted or black malt.

“The first of these alone is used for ales; indeed, for the article so extensively known as pale bitter ale, very light-colored malt only is applicable. The brown malt is the article in general use for giving the flavor to beer, and the roasted malt is chiefly used with the latter sort in imparting the requisite color to porter and stout.”

*Tobacco.*—This is used in the form of smoking, chewing, or snuff-taking more universally than any other stimulant or narcotic—among the civilized, the semi-civilized, and the barbarians—probably among 900,000,000 of the human race.

It is estimated that *four billion pounds* of tobacco are raised annually throughout the world, which is nearly four pounds a year for every man, woman, and child on the face of the earth. Six millions of acres of land are devoted to its cultivation. The history of tobacco is now pretty well known. It is supposed to be indigenous to tropical America. Certainly it was not used in Europe until it was brought there after the discovery of America.

Tobacco received its name from the fact that the plant was first recognized by a Spanish monk in Tabaca, a province of St. Domingo. How long it had been used by the Indians prior to the discovery of America it is impossible to ascertain. Doubtful legends say that the plant was known in Asia many centuries ago, but that it was never smoked or chewed, as at the present day. In 1560 it was reported to the court of Portugal by Nicot, the ambassador of the French, and was introduced from Virginia into England.

It was popularized by the example and influence of Sir Walter Raleigh, and by the close of the sixteenth century it had become quite well known throughout England. Since that time it has extended over a large part of the globe. It was introduced into Turkey and Arabia in the early part of the seventeenth century.

Says Johnston: “In Turkey the pipe is perpetually in the mouth. In India, all classes and both sexes smoke. The Siamese chew moderately, but smoke perpetually. The Burmese, of all ranks, of both sexes, and of all ages, down even to infants of three years old, smoke cigars.”

In China the practice is so universal that every female, from the age of eight or nine, wears, as an appendage to her dress, a small silken pocket, to hold tobacco and a pipe.



There is reason for believing that the Chinese knew of tobacco, as they knew of almost everything else, long before the discovery of America.

*Opium*.—This is used habitually among 400,000,000 inhabitants of the East, just as we use tobacco here. It is estimated that it is indulged in by about 100,000 in the United States. It is certainly used among us much more than formerly. It is, as all know, the juice of the poppy.

*Hemp and Haschisch*.—These are used in Turkey, India, Persia, Africa, and Brazil, by two or three hundred millions of people.

Hemp appears to have been used in the days of Homer, Herodotus, and Diodorus Siculus. It is raised chiefly in India, Persia, and Arabia. The hemp is a resinous exudation from the plant. It is also raised in Africa and Brazil.

In the plains of India it is consumed in every form, and on the slopes of the Himalayas it is cultivated for smoking as high up as the valleys of Sikkim. In Persia, in the east of Europe, and in Mahomedan countries it is in extensive use. In Northern Africa it is largely employed by the Moors. In central and tropical Africa it is almost everywhere known as a powerful medicine and a desired indulgence. In Southern Africa the Hottentots use it, under the name of dasha, for purposes of intoxication; and when the Bushmen were in London they smoked the dried plant in short pipes, made of the tusks or teeth of animals. And what is astonishing, when we consider the broad seas which intervene, even the native Indians of Brazil know its value, and delight in its use; so that over the hotter parts of the globe generally, wherever the plant develops in abundance its peculiar narcotic principle, its virtues may be said to be known; and more or less extensively made use of.

*Effects of Hemp on the System*.—"This wide use of the plant implies that the effect of hemp upon the system is generally very agreeable. In India it is spoken of as the increaser of pleasure, the exciter of desire, the cementer of friendship, the laughter-mover, and the causer of the reeling gait—all epithets indicative of its peculiar effects."—*Johnston*.

The effect of hemp, or of *haschisch*, which is prepared from hemp, by boiling the leaves and flowers with water and butter, adding cloves, nutmegs, mace, &c., is said to be very delightful. It obliterates ideas of time, and creates a kind of temporary heaven. These effects, however, vary in different individuals. The word "*assassin*" is said to be derived from the fact, that some individuals under the influence of *haschisch* are inclined to rave furiously, to

threaten, and even to murder. These terrible effects are observed among the Orientals more than among the inhabitants of our own land.

On some persons it causes the most intense anguish for several hours, a sort of double consciousness, and symptoms somewhat similar to the hallucinations of *delirium tremens*.

*Coffee*.—This familiar drink is used to the extent of about 1,000,000,000 pounds annually.\* Like most of our popular stimulants and narcotics, it has come into use chiefly within the past two or three centuries. Like many of the other stimulants and narcotics, it was introduced amid great opposition. Like other stimulants and narcotics also, it has triumphed over all its enemies, and is now used in the best portion of the globe.

“*Arabian Coffee*.—The tree which produces this seed is said to be indigenous to the countries of Enárea and Caffa, in Southern Abyssinia. In these districts the coffee-tree grows like a wild weed over the rocky surface of the country. The roasted seed or bean has also been in use as a beverage in Abyssinia generally from time immemorial, and is at the present day extensively cultivated in that country. In Persia it is known to have been in use as early as the year 875. From Abyssinia it was introduced into Arabia in the beginning of the fifteenth century, when it partly superseded the older chaat, or Abyssinian tea. About the middle of the sixteenth century it began to be used in Constantinople, and in spite of the violent opposition of the priests, became an article of general consumption. In the middle of the seventeenth century (1652), the first coffee-house was opened in London by a Greek named Pasqua; and twenty years after the first was established in Marseilles.”—*Johnston*.

The use of coffee was unknown to the Greeks and Romans, and does not appear to have been known in the Asiatic countries as late as the time of the Crusades in the thirteenth century, although its first introduction into Europe was from Arabia. It seems to have been earliest in use in Ethiopia, where it has been drunk by the natives for a great length of time. Mr. Bruce, in his Travels in Abyssinia, states that the Gallæ, a wandering nation of Africa, in their incursions on Abyssinia, being obliged to traverse immense deserts, and wishing to be encumbered with as little baggage as possible, take with them a mixture of coffee and butter rolled up into balls, and carried in a leathern bag. One of these, about the size of a billiard ball, keeps them, they say, in strength and spirits during a day's fatigue.

\* Two hundred millions of pounds are imported to the United States alone.



"Coffee was introduced into Mecca, Medina, and Cairo about the middle of the fifteenth century, and two coffee-houses were opened at Constantinople in 1554. Both at Cairo and in Turkey, it had to encounter political and religious opposition. The dervises affirmed that roasted coffee was nothing but a coal, and that the eating of coals was forbidden by the laws of their prophet. So that the coffee-houses were obliged to be shut up until 'a more sensible mufti' succeeded in convincing the people that roasted coffee was not a coal; upon which they were again opened. In later years the use of coffee became extremely prevalent throughout the East. Houses for selling it were established in all parts of the Turkish empire: it was introduced into private families, and the refusal of a husband to supply his wife with coffee was reckoned among the legal causes of a divorce. In Europe coffee was introduced into France and England about a century and a half ago. So rapid was the progress of a taste for it after it became known, that in eight years from its introduction it had become in England a subject of public revenue."—*Bigelow*.

*Other Coffees*.—"Besides the real *Coffea Arabica*, other species of the coffee-plant are grown in various countries, and yield a useful marketable bean. Thus, in Silhet and Nepaul the *C. Beuhalensis* is cultivated; on the coast of Mozambique, the *C. Mozambicana*; on the coast of Zanguebar, the *C. Zanguebaria*; and in the Mauritius, the *C. Mauritiana*. The seed of the last of these tastes disagreeably sharp and bitter, and sometimes causes vomiting, yet it is in some places cultivated instead of the *Coffea Arabica*. It is possible that these so-called different species may, like the varieties of the tea-plant, be only differently modified forms of the same original species."—*Johnston*.

Very many substitutes are used for coffee. One of the best known of these is *chicory*. It is largely used to adulterate coffee; in moderate quantities is not harmless, but when used to any great extent is decidedly injurious.

"It is a native weed, which, with its large pale-blue flowers, is seen scattered about in numerous places. It has a large white parsnip-like tap-root, which increases in size when the plant is subjected to cultivation. This root abounds in a bitter juice, which has led to its use as a substitute for coffee. The plant is now extensively cultivated for the sake of its root."—*Johnston*.

*Chicory* itself is often adulterated. It is almost as hard to find it pure in the shops, as it is to find pure coffee itself. According to Johnston, *Venetian red* is much used to color *chicory*. Nor is this all; Venetian red is itself adulterated. The manufacturer

grinds up his color with *brick-dust*, in order to be able to sell it cheaper and to give it a variety of *colors*.

*Tea*.—Of the different varieties of tea there are raised annually about 3,000,000,000 *pounds*. It is estimated that three millions of acres of land are devoted to the culture of tea. It is more used than any other form of beverage, except water. It is a product of temperate climes, and seems to be adapted for all countries. It is certainly used among more than half of the human race. Its cultivation, transportation, and sale give employment to millions of men and billions of capital. In New York City alone there are a number of large firms whose yearly transactions in the article of tea are fabulous. Much as it is used in this country and in England, it is used still more freely in China and Russia, where it is drunk several times daily.

Like coffee, tea was not introduced into Europe until the seventeenth century. It is stated that it did not come into general use in China until the year 600, and was introduced into Japan in 810.

The tea-plant is a small evergreen tree or shrub, of the height of six or eight feet. It grows in the valleys, and on the sloping sides of mountains with a southern exposure. In Japan it is planted around the borders of fields, without regard to the kind of soil; while in China, where it is an important article of commerce, whole fields are covered with it, and cultivated with the greatest care.

The origin of the employment of tea as a beverage amongst the Chinese is wrapped in the obscurity which generally belongs to ancient usages; and a fabulous tale is narrated as to its introduction among inhabitants of the empire, whilst, as is usual with fables, it has been imagined to have some allegorical allusion, which, if explained, would satisfy the lover of antiquarian lore. The tale is thus related by one of the compilers of a history of China:

“Darma, a very religious prince, and third son of an Indian king named Kosjusvo, is said to have landed in China in the year 510 of the Christian era. He employed all his care and thought to diffuse throughout the country a knowledge of God and religion; and, being desirous to excite men by his example, imposed on himself privations and mortifications of every kind, living in the open air, and devoting the days and nights to prayer and contemplation. After several years, however, being worn out with fatigue, he fell asleep against his will; and, that he might faithfully observe his oath, which he thought he had violated, he cut off his eyelids and threw them on the ground. Next day, having returned to the same spot, he found them changed into a shrub which had never before been produced. Having eaten some of the leaves of it, he found



his spirits exhilarated and his former vigor restored. He recommended this aliment to his disciples and followers. The reputation of tea increased, and after that time it continued to be generally used. Kampfer, in his '*Amœnitates Exoticæ*,' gives the life with a portrait of this saint, so celebrated in China and Japan. There is seen at the feet of Darma a reed, which indicates that he had traversed the seas and rivers."—*Simond on Tea*, p. 12.

Nicolaus Fulpus was about the first medical man who wrote professionally upon tea; but his were not original observations: they were the opinions of the most eminent men which he had collected to give to the world. But in 1678 appeared the first edition of a book, which speedily ran through three large impressions, and had a considerable influence upon the introduction of tea. It was entitled "*Cornelio Bontœkoe, Tractaat van het excellenste Kruid Thee*." Although this work was, from the extravagance of its commendations on tea, severely handled by some of the critics, it was translated into many languages, and quoted as the highest authority. He pronounced tea to be the infallible cause of health, and that if mankind could be induced to drink a sufficient quantity of it, the innumerable ills to which man is subject would not only be diminished, but entirely unknown. He thinks that *two hundred cups* daily would not be too much. He is said to have been rewarded for his judgment by the liberality of the Dutch East India Company. Heydentrück Overcamp, who wrote the life of Bontekoe, states that his inducement to write was to recommend himself to his fellow-citizens, and to defend himself against his colleagues, who did not follow his theory or his practice. Etmüller recommended tea as a fine stomachic, cephalic, and anti-nephritic. Pechline wrote a dialogue on tea, which he entitled "*Theophilus Bibaoulus*," and several poets indulged themselves in its praise. Petit wrote a poem; Peter Francius, two anacreontics; Heineich, a Doric Melydrion; and our poet-laureate, Tate, joined the melodious bards. Whilst it met with so much approbation there were, likewise, those who were not equally satisfied with its merits. Boerhaave, Van Swieten, and others attempted to stem the tide that was setting in its favor; but they have proved themselves incapable of resisting the general impression, for no beverage that has ever yet been introduced sits so agreeably on the stomach, so refreshes the system, soothes nervous irritation after fatigue, or forms a more grateful repast. It contributes to the sobriety of a nation; it imparts all the charms to society which spring from the enjoyment of conversation, without that excitement which follows upon a fermented drink.

The introduction of tea-drinking into England has been ascribed

to Lord Arlington and Lord Orrery, and the year 1666 (the *annus mirabilis* of Dryden) has been assigned as the exact date; but in the diary of Mr. Pepys, Secretary to the Admiralty, the following is registered: "I sent for a cup of tea, a Chinese drink, of which I had never drunk before." In the diary of Henry, Earl of Clarendon, there is a memorandum: "Père Couplet supped with me, and after supper we had tea, which he said was really as good as any he drank in China." The first historical record, however, is an act of Parliament, passed in the year 1660, 12 Carl II. c. 23, which enacts that a duty should be laid of eight pence per gallon on all tea made and sold in coffee-houses; which were visited twice daily by officers, whose duty it was to ascertain what quantity had been made.

Very much has been said and written of the difference between green tea and black tea. The common impression is, that green tea is always poisoned more or less in the preparation. This impression is only partly true. Undoubtedly drugs are sometimes used to color the teas; but in China, in the tea-growing regions, the two varieties are made by difference in the manner of preparation.

Johnston thus describes the processes:

"First, That in the process of drying the leaves are roasted and scorched in such a way as necessarily to bring about many chemical changes within the substance of the leaves themselves. The result of these changes is to produce the varied flavor, odors, and tastes by which different varieties of tea are more or less distinguished.

"Second, That the treatment or mode of handling by which the leaves are converted respectively into green and black teas, is the cause of the different colors of these two main varieties.

"It is by lengthened exposure to the air, therefore, in the process of drying, accompanied, perhaps, by a slight heating and fermentation, that the dark color and distinguishing flavor are given to the black teas of commerce. The oxygen of the atmosphere acts rapidly upon the juices of the leaf during this exposure, and changes chemically the peculiar substances they contain, so as to impart to the entire leaf the dark hue it finally acquires. The precise nature, however, of these changes has not, as yet, been chemically investigated."

"*Maté, or Paraguay tea*, though not used over so large an area as the Chinese tea, is as much the passion of the Brazilians and their neighbors in Southern America, as the latter is of the nations of north-eastern Asia. It is prepared from the dried leaves of Brazilian holly, is said to have been in use among



the Indians from time immemorial; has been drunk by all classes in Paraguay since the beginning of the seventeenth century, and is now consumed by 'almost the whole population of South America.' The leaf of this tree is four or five inches long, and after being dried it is rubbed to powder before it is infused. The dried leaf has much of the aroma of some varieties of Chinese tea, and the infusion has a pleasant odor, and an agreeable bitter taste. In the state in which it is commonly used in South America, it is more exciting than China tea, producing a kind of intoxication, and by excessive use leading even to *delirium tremens*."—*Johnston*.

"Some writers have asserted that the tea is roasted upon plates of copper, and that its color is owing to verdigris, with which it thus becomes impregnated. But those travellers who are most entitled to credit affirm that the plates are, without exception, of iron, and Dr. Lettson, after a great number of experiments made with chemical tests, never detected any trace of copper; so that this suspicion appears to be void of foundation."—*Bigelow*.

This Maté is very largely used in the whole of South America. In many respects it is very similar to the tea of China, though much inferior. It acts, however, upon the kidneys and bowels.

A great many substitutes have been used for tea. Johnston gives the names of *twenty-four* of these, and states that many more might be mentioned.

"*Abyssinian Tea*, called in its native country Khat or Chaat, is very extensively cultivated in Shoa and the adjoining regions, and is in general use among the inhabitants, just as tea is in China. It consists of the dried leaves of a species of small tree from which the poorer classes of Chinese prepare an inferior kind of tea. In a light gravelly soil the plant attains a height of twelve feet. The leaves are plucked in the dry season, and well dried in the sun. They are either chewed, boiled in milk, or infused in boiling water, and, by the addition of honey, yield a pleasant beverage. They have much resemblance to Chinese tea, both in their qualities and their effects. They are bitter to the taste, possess exhilarating properties, and dispel sleep if used to excess.

"The leaves of this plant are also used green. Forskäll states that the Arabs eat them green because of their property of preventing sleep. To such a degree do they exhibit this influence, that a man who chews them may stand sentry all night without feeling drowsiness. They are also regarded as an antidote to the plague; and the Arabs believe that the plague cannot appear in places where the tree is cultivated. Botta adds to these qualities that, when fresh, the leaves are very intoxicating."—*Johnston*.

*Cocoa*.—The different varieties of cocoa are used to the extent of 100,000,000 of pounds annually. It is prepared from seeds. It is sold in the shops in *three* different and familiar forms:—

1. *Rock-cocoa of the stores*.—This is made by roasting the whole cocoa bean, beating it into a paste, and then mixing it with sugar, starch, &c.

2. *Cocoa nibs*.—These are prepared by depriving the bean of the husk and then crushing it. This is the purest form of cocoa.

3. *Chocolate paste*.—This is prepared by shelling the bean, grinding it into a paste, and then mixing it with sugar, cinnamon, vanilla, &c.

There are several varieties of cocoa—the Mexican, Brazilian, and one or two substitutes.

“The Mexican cocoa is the seed of the *Theobroma cacao* (fig. 35). This is a small but beautiful tree, with bright dark green leaves, which is a native of the West Indies and of the central regions of America. It grows spontaneously in Mexico and on the coast of Caraccas, and forms whole forests in Demerara.

“When the Spaniards first established themselves in Mexico, they found a beverage prepared from this seed in common use among the native inhabitants. It was known by the Mexican name of *chocollatl*, and was said to have been in use from time immemorial. It was brought thence to Europe by the Spaniards in 1520, and has since been introduced more or less extensively as a beverage into every civilized country. Linnæus was so fond of it that he gave to the tree the generic name of *Theobroma*—‘Food of the Gods.’”—*Johnston*.

*Lettuce*.—This is a kind of substitute for opium. The juice of the plant somewhat resembles opium. Every one who has eaten lettuce for dinner knows that it will produce drowsiness.

“If the stem of the common lettuce, when it is coming into flower, be wounded with a knife, a milky juice exudes. In the open air this juice gradually assumes a brown colour, and dries into a friable mass. The smell of this dried juice is strongly narcotic, recalling that of opium. It has a slightly pungent taste, but, like opium, leaves a permanent bitter in the mouth. It acts upon the brain after the manner of opium, and induces sleep.

“To this crude extract the name of *Lactucarium* has been given. Like opium, it dissolves in water to the extent of about one-half, and in this soluble portion the narcotic virtue resides. The principal active ingredient is supposed to be a peculiar substance named *lactucarium*, of which the crude contains about one-fourth of



its weight. It contains other active ingredients, however, the chemical nature and physiological influence of which have not as yet been rigorously investigated.”—*Johnston*.

“*Lactucarium* is one of those narcotics in which many of us unconsciously indulge. The eater of green lettuce as a salad takes a portion of it in the juice of the leaves he swallows; and many of my readers, after this is pointed out to them, will discover that their heads are not unaffected after indulging copiously in a lettuce salad. Eaten at night, the lettuce causes sleep; eaten during the day, it soothes and calms, and allays the tendency to nervous irritability. And yet the lover of lettuce would take it very much amiss if he were told that he ate his green leaves, partly at least, for the same reason as the Turk or Chinaman takes his whiff from the tiny opium pipe; that, in short, he was little better than an opium eater, and his purveyor than the opium-smugglers on the coast of China.”—*Johnston*.

Other substitutes for opium are:

*Syrian Rye*.—It is used by the Turks.

*Bulls' Hoof*.—This is used in Jamaica, and has been called the “*Dutchman's laudanum*.”—*Brown*, quoted by *Johnston*.

“*The Hop*, which may now be called the English narcotic, was introduced into this country at a comparatively recent period. It may have been employed in Germany in the times of the Roman writers, but was probably unknown to them. Its use, as an addition to malt liquor, appears to be of German origin. Hop gardens, by the name of *Humularie*, are spoken of in documents of the early part of the ninth century, frequently in those of the thirteenth century. In the breweries of the Netherlands, the hop seems to have been introduced about the beginning of the fourteenth century. From the Low Countries, or, as some say, from Artois, which borders upon them, it was brought to England in the reign of Henry VIII., some time after his expedition against Tournay, and about the year 1524. In the twenty-second year of his reign (1530), that monarch, in an order respecting the servants of his household, forbade sulphur and hops to be used by the brewers. Three-quarters of a century later (1603), the introduction of spoilt and adulterated hops was forbidden by James I., under severe penalties. This appears to show that, though considerable attention is known to have been already given to the cultivation of the hop in England, a large part of the hops supplied to the home market was still brought from abroad.”—*Johnston*.

Hop is chiefly used in the manufacture of *beer*.

It gives to beer an agreeable bitter taste.

It directly affects the *brain* and nervous system by virtue of its narcotic properties. The well-known soporific effects of beer are caused by the hop used in its manufacture.

Hop also keeps beer from souring, by arresting fermentation.

There are a number of varieties of the hop, which differ very widely in quality.

*Hop pillows* were once prescribed to King George III. of England, as a remedy for sleeplessness, and since that time they have continued to be used for that purpose.

Whatever effect comes from the hop pillow must be due to the escape of the volatile narcotic principles in exceedingly small quantities.

*Coca* is a narcotic that is used among 10,000,000 of the human race, chiefly among the South American Indians. It must not be confounded with the beverage *cocoa*.

"It is not less interesting than the narcotics of the East, either in its social or in its physiological relations. It is little known in Europe, its use as an indulgence being in a great measure confined to the native Indians of Bolivia and Peru.

"The *Erythroxylon coca* is a bush which attains the height of six or eight feet, and resembles the black thorn in its small white flowers and bright green leaves. It is a native of the tropical valleys which occur on the eastern slope of the Andes in Bolivia and Peru, and it still grows wild in many parts of these countries."—*Johnston*.

"*Consumption of Coca Leaf*.—We have no accurate data from which to form an estimate of the actual weight of coca leaf collected and consumed in Bolivia and Peru. Pöppig estimates the money value of the yearly produce to be about four and a half millions of Prussian dollars, which, at 1s. a pound, the price it yields to the grower, would make the annual produce nearly 15,000,000 lbs. The approximation is sufficient to show us its importance to the higher regions of South America, in an agricultural and commercial, as well as in a social point of view."

"When we consider that eastward from Bolivia and Peru the culture and use of coca have extended into parts of Brazil and to the banks of the Amazon, it will not appear exaggerated if we estimate the actual growth and consumption of the dried coca leaf at 30,000,000 lbs. a year. At 1s. a pound, this is worth a million and a half sterling; and at the average produce of 800 lbs. an acre, it implies the use of 37,000 acres of good and carefully cultivated land for the growth of this plant. We may estimate also that the chewing of coca is more or less indulged in among about ten millions of the human race."—*Johnston*.

By the Peruvian Indians *coca* is both smoked and chewed. The leaves, dried in the sun, are the portions of the plant which are used. Of these the Indian will consume daily an ounce, or an ounce and a half.

Its effects at first are pleasant and mild. When used to excess it begets a kind of insanity. In South America, an Indian who becomes a great slave to the use of the *coca* is called a *coquero*—a term meaning the same as our *drunkard*.

*The Betel Nut.*—This is a narcotic which, though hardly known by name in this country, is yet used among 100,000,000 of the human family.

It is the seed of one of the species of palm. It is cultivated in India, Malabar, Ceylon. It is chewed like tobacco. It is to the Eastern Islands what the *coca* is to South America. Those who use it become most extravagantly fond of it. Like tobacco and opium, it makes them unwilling slaves. When used in moderation its effects are agreeable and exhilarating. Among the wretched poor of India it is an actual substitute for food. Millions of the natives of India would rather be denied their regular meals than their *betel nut*.

“The visible effects of the betel are, that it promotes the flow of the saliva, and lessens the perspiration from the skin. It tinges the saliva red, so that when spit out it falls on the earth like blood. It gives a red color to the mouth, teeth, and lips, which, though at first sight disgusting to Europeans, is by the natives considered ornamental. It imparts also an agreeable odor to the breath, and is supposed to fasten the teeth, cleanse the gums, and cool the mouth. The juice is usually, but not always, swallowed.”

“We have no means of estimating the absolute quantity of this nut which is consumed yearly by the Asiatic nations, but it must be very great. It is chewed by probably not less than fifty millions of men! If we allow to each chewer ten pounds weight a year, which is less than half an ounce a day, this would give the enormous consumption of five hundred millions of pounds weight every year! Only tobacco, among the narcotics in common use, is used in larger quantity than this. The small quantity of the betel-nut imported into this country is converted into charcoal for tooth-powder, probably from some imaginary idea that it is superior for this purpose to other kinds of charcoal.”—*Johnston*.

2. *Chica, or Maize Beer.*—The use of malt beer in Germany, and probably also in England, is very ancient, and that of *chica* or maize beer in South America appears to be equally remote. It was a common drink of the Indians long before the Spanish conquest.



The usual way of preparing *chica* is to water or moisten Indian corn, as the English maltster does his barley—to leave it till it sprouts sufficiently, and then to dry it in the sun. It is now maize malt. This malt is crushed, mashed in warm water, and then allowed to stand till fermentation takes place. The liquor is of a dark yellow color, and has an agreeable, slightly bitter, acid taste. It is in universal demand throughout the west coast of South America, and is consumed in vast quantities by the mountain Indians. Scarcely a single hut in the interior is without its jar of the favorite liquor.

In the valley of the Sierra, however, the most highly prized *chica* is made in a somewhat different manner. “All the members of the family, including such strangers as choose to assist in the operation, seat themselves on the floor in a circle, in the centre of which is a large calabash, surrounded by a heap of dried maize (malt). Each person takes up a handful of the grain and thoroughly chews it. This is deposited in the calabash, and another handful is immediately subjected to the same process, the jaws of the company being kept continually busy until the whole heap of corn is reduced to a mass of pulp. This, with some minor ingredients, is mashed in hot water, and the liquid poured into jars, where it is left to ferment. In a short time it is ready for use. Occasionally, however, the jars are buried in the ground, and allowed to remain there until the liquor acquires, from age, a considerable strength, and powerful intoxicating qualities.

“*Chica* thus prepared is called *chica mascada*, or chewed *chica*, and is considered far superior to that prepared from maize crushed in the usual manner. The Serrano believes he cannot offer his guest a greater luxury than a draught of old *chica mascada*, the ingredients of which have been ground between his own teeth.”—*Johnston*.

This method of making beer seems hideous enough. But the explanation of the process is quite interesting. The saliva changes the starch into sugar. This sugar afterwards ferments and makes beer.

According to *Von Tschudi*, *chica* can be made from grapes, pine-apples, rice, barley, peas, and bread.

“*Palm Wine, or Toddy*.—The sap of many palm-trees is rich in sugar. In some countries this is extracted by boiling down the collected juice, as cane sugar is extracted from the expressed juice of the sugar-cane. In other countries the juice is allowed to ferment, which it does spontaneously, and in hot climates within a very short period of time. This fermentation converts the alcohol and juice which contains it into an intoxicating liquor.

"In the islands of the Indian Archipelago and the Philippines an intoxicating liquor is prepared in this way from the sap of the gomuti palm. It is called *neva* in Sumatra, and the Batavian arrack is distilled from it. The cocoa palm produces the palm wine known in India and the Pacific by the name of toddy."—*Johnston*.

One tree yields from two to six pints of sap or "*toddy*." After standing a few hours it ferments. When this fermented juice is distilled it makes a powerful brandy. It is said that the palm wine is used by a larger number of the human race than the wine of the grape.

It is used in Chili, South America, in India, and throughout Africa.

The taste of the best qualities is said to be very agreeable, closely resembling champagne.

*Sugar-cane Wine, or Guarapo*.—This is the fermented sap of the sugar-cane. It receives its name from the fact that it is largely used among the natives of Guarapo.

"*Bouza, murma, or millet beer*, is a favorite drink of the Crim Tartars. They prepare it from fermented millet-seed, to which they add certain admixtures which render it excessively astringent. They call it *bouza*."—*Oliphant*.

"The *Arabians, Abyssinians*, and many *African* tribes give the same name to a fermented drink which they usually prepare from the seeds of the *Poa Abyssinica*. They occasionally employ millet-seed, however, and even barley, for the purpose. Their *bouza* is described as a sour, thick drink."—*Johnston*.

This drink is much like our ordinary malt liquors. It is sometimes sucked through a tube, as boys suck cider through a straw.

According to Hooker it is very weak, but in a hot day's march is a very grateful beverage. It is drunk while warm, like our tea and coffee.

"*Quass or rye beer*, a favorite Russian drink, is a sharp, acid, often muddy liquor, which, in taste and appearance, resembles some of the varieties of *bouza*. It is made by mixing rye-flour, and occasionally barley-flour, with water fermenting. It may possibly contain lactic acid, but I am not aware that its composition has yet been made the subject of special chemical inquiry.

"This is one of the cases in which unmalted grain is employed in the manufacture of beer on the continent of Europe.

"*Koumiss, or milk beer*.—Milk, as I have explained in the preceding chapter, contains a peculiar kind of sugar, less sweet than cane sugar, to which the name of milk sugar is given. This sugar, when

dissolved in water, does not ferment upon the addition of yeast ; but when dissolved in the milk along with the curd and butter, it readily ferments, is transformed into alcohol and carbonic acid, and gives to the liquor an intoxicating quality. This fermentation will take place spontaneously, but it is hastened by the addition of yeast or of a little already fermented milk. The fermented liquid is the *koumiss* of the Tartars. Mare's milk is richer in sugar than that of the cow, and is usually employed for the manufacture of milk beer."—*Johnston*.

*Brandy* can be obtained from the *koumiss* by distillation. The natives call this milk-brandy *arraca*. In the north of Scotland and in Ireland buttermilk is kept until it undergoes a vinous fermentation.

*Ava*.—This liquor is used in the South Sea Islands, in the Tonga, Feejee, and Samoan Islands ; in short, throughout the Pacific Ocean. It is prepared in very much the same way as the *chica* or *maize beer*.

It is a very interesting and suggestive fact that this method of preparing fermented drink—chewing the *ava* and the *chica*—should exist in regions so far apart as South America and the islands of the Pacific.

The process of making the *ava* and its effects are thus described by *Johnston* :

"The name of *ava* is given to the root of the intoxicating long-pepper (*Macropiper methysticum*), which is chewed, either in the fresh or in the dried state, as the Indian chews his maize. The pulp is then mixed with cold water, which after a brief interval is strained from the chewed fibre, and is ready for use. The taste, to one unaccustomed to it, is not pleasant. It reminded Captain Wilkes of the taste of rhubarb and magnesia ! According to the white persons who have tried it, this infusion does not intoxicate in the same manner as ardent spirits. It more resembles opium in some of its effects ; producing a kind of temporary paralysis, tremors, indistinctness and distortion of vision, and a confused feeling about the head."

*Cocculus Indicus* is chiefly known as a means of adulterating beer and other drinks. It is very bitter, has a rich taste, and directly affects the brain, and thus produces intoxication.

It is very powerfully poisonous when used in quantity. The poorer classes like to have their liquor drugged with it, because they can "*feel it*." It takes a less quantity of liquor that has been drugged with *cocculus indicus* to affect one than of pure liquor.

"It is the fruit or berry of the *Anamirta cocculus*, a beautiful



climbing-plant, which is a native of the Malabar coast and of the Indian Archipelago. It is sometimes called the Levant nut, or the *Bacca orientalis*. It has some resemblance to the bayberry, and in 1850 was imported into this country (England) to the extent of 2,359 bags, of one hundredweight each."—*Johnston*.

There is no doubt that it is slowly injurious to the system even in moderate doses, and it should be regarded as a crime to adulterate liquors with it. Very much of the intemperance among the lower and degraded classes is caused by the *cocculus indicus* in the liquor which they drink.

A person who has been made drunk by it feels worse after the debauch than one who has been made drunk simply on pure alcoholic liquors.

*Sweet Gale*.—This narcotic is not known in this country, but is used in Sweden. It is said to be used largely for the purpose of imparting bitterness to beer.

*Emetic Holly*.—This narcotic is used by the Indians of Florida. The infusion of the leaves is called the "black drink," and, according to Johnston, is drunk largely by the chiefs when about to be engaged in important deliberations.

*Siberian Fungus*—a kind of toad-stool.—This is a native of Kamtschatka. It closely resembles our common mushroom. It is gathered in the hot weather and dried. It is chewed like tobacco. It produces at first lightness of spirits, then giddiness, flushing of face, and finally, in sufficient quantities, intoxication. Some of our own mushrooms are also narcotic in their effects. It is well known that certain varieties when eaten produce poisonous effects.

*Thorn Apple* (*stramonium*).—This is indulged in by the Indians of the Andes. From the fruit of the plant they prepare a strong narcotic drink. It produces stupor and sometimes furious excitement.

Among other stimulating and narcotizing preparations I may merely mention—

Arrack, made from rice, used by the Hindoos and Malays.

Raki, " " " " Greeks and Turks.

Samshoo, " " " " Chinese.

Sacio, " " " " Japanese.

Kawa, " macropiper " " Pacific Islanders.

Vodki, " potato " " Russians and Poles.

Tallah, " millet " " Abyssinians.

In surveying the history of the use of these various stimulants and narcotics we learn

1. *That some forms of stimulant or narcotic have been used all over the world, and from time immemorial.*

2. *That their use has increased with the progress of civilization.*

3. *That at the present time they are used to the greatest extent and in the largest variety by the most civilized and Christian nations—England, France, Germany, and the United States.*

According to the recent report of Mr. Wells, special commissioner of revenue, it seems that *the value of the liquors annually sold over the counter in this country alone is equal to half of our national debt.*

This says nothing of tobacco, which is now used so freely; nothing of tea and coffee, which are used in every family, and to the extent of several pounds annually for every man, woman, and child in the country; nothing of opium, which is used habitually by nearly 100,000 of our countrymen; nothing of chocolate (cocoa, shells, &c.), which as a substitute for coffee is found in every saloon and hotel, and freely used in thousands of families.

It is safe to say that the money annually expended for stimulants and narcotics in this country *would pay the whole of our national debt, principal and interest*, and at the same time support all our benevolent societies.

Important and practical questions now arise. Shall we continue to use these stimulants and narcotics? Do they fulfil any purpose in the animal economy? Are they, in any sense, food? Would not the world be better without them? If we are to use them at all, what shall we use? How shall we use without abusing them?

Before attempting to answer these queries I must say, at the outset, that I *cannot* answer them for every individual. Every person must decide for himself, in the light of science and of his own individual experience, whether to use these substances or to abstain from them, just as he decides what kind of food to eat and what to avoid. All I shall attempt to do will be to give information and to arrange facts which may help my readers in answering these questions. All I can do is to present the *general* principles of science, by which my readers may enlighten their consciences and learn their *individual* duty.

There are some general facts that will apply to all these stimulants and narcotics.

1. *They all contain poison.* The active principle of tea is *theine*; of coffee, *caffeine*; of chocolate, *theobromine*; of tobacco, *nicotine* and *nicotianin*; of opium, *morphine*; of hops, *lupuline*; of fermented and distilled liquors of all kinds and varieties (wines, beers, cider, porter, whiskey, rum, gin, brandy, arrack, koumiss, samshoo, sacio, kawa, vodki, toddy, tallah, raki), is *alcohol*.

All these active principles are poisonous. Nearly all of them,

when given in sufficient quantities, will kill animals, and in a very short time.

Even *theine* and *caffeine*, in large doses, will kill animals, as has been recently proved by the experiments of Dr. Amory. That nicotine and alcohol will kill animals and men is now known to every one. When *theine* is taken pure by a human being it causes terrible nervousness and distress, and probably a sufficient quantity would prove fatal. The probability is that experiments would show that the active principles of all the other stimulants and narcotics are capable of producing fatal results, when given in sufficient quantities.

The fact that all these stimulants and narcotics contain poison does not assist us much in the solution of the question of their effects on the system, *because there is poison, in nearly all of our ordinary articles of diet.*

There is poison in our garden lettuce, and in the hops with which we raise our bread. The oils contained in our table mustard and pepper, and in that most common and healthy vegetable, the onion, are among the most acrid and destructive poisons with which chemistry is familiar. Phosphorus is one of the most virulent of poisons, and even in very small doses it has been known to destroy life; in moderate quantities it powerfully stimulates, like alcohol. And yet phosphorus exists in all nitrogenous alimentary substances, and has been proved to be indispensable to the vigor and health of the brain. Children especially, who for any long period are confined to food in which phosphorus does not exist to a sufficient degree, are very apt to suffer from disease of the bones and scrofulous enlargement of the glands.

The most skilful chemistry can hardly prepare a meal that would not contain more or less poisonous elements. There is poison in the dry loaf and plainly-served vegetables of the hardy laborer, in the yolk of the egg that we give to the tender invalid, and in the very milk that the infant draws from its mother's breast.

But the use of poison is not confined to our articles of food. Poison is a normal constituent of the atmosphere. Even in the healthiest localities it contains more or less carbonic acid, and not unfrequently slight traces of iodine and nitric acid. Those who are most ignorant of chemistry know that these agents, when undiluted, are terribly destructive and fatal. Therefore, then, not only in every mouthful of food we eat, but in every breath of air we inspire, there are elements of poison that, in a pure and uncombined form, would prove instantly fatal to all animal creation. But the consumption of poisons does not stop with our air and food.



The water we drink or in which we bathe is rarely, if ever, found in a state of absolute purity.

If there be any drink in the world that may properly be called natural, surely it is the waters of our springs and rivers, but all of these contain poisonous substances in greater or less proportions. The purest springs hold in solution the chlorides of sodium, magnesium, or potassium, as well as lime, in combination with sulphuric acid. Even rain-water, the purest of all, contains traces of nitric acid, that it derives from the atmosphere in its passage through it.

2. *They all seem to have the power of sustaining the system within certain limits, and to a certain extent supply the place of food.*

Tea and coffee drinkers know by experience that they can both live and work on their favorite beverages without any solid food whatever. There are thousands—aye, millions—in the world who would give all the rest of the breakfast rather than their cup of coffee. There are millions of ladies in the land to whom their cup of tea is more important—or, at least, seems to be so—than all their other food.

Opium has a wonderful power of sustaining the system, the natives of the East working hard for days on nothing but a little of this drug.

Tobacco has the same power, though to a less degree. Great smokers are usually moderate eaters.

The South American coca has the same effect. The Indians there travel for days subsisting on nothing else.

Alcohol—in all its myriad preparations—is a powerful substitute for food; I therefore term it *negative* food. In fevers, in exhaustion, and in health even, it supplies the place of food. When used largely it impairs the appetite, and may almost destroy it. This fact is a powerful argument against the free use of this agent.

Everybody knows that sots and debauchees are usually moderate eaters. The confirmed drunkard always prefers his grog to his dinner. Those who indulge in champagne and brandy to any extent partake less freely of the solid articles on the table, even when the system is in excellent health, and all the conditions for a vigorous appetite are fulfilled. The fact that drunkards eat so little, and even neglect their meals, has long been so patent to superficial observation, that temperance men have seized upon it—and with good reason—as an argument against intemperance. The body needs positive, solid nutriment, and any great excess in the use of alcoholic liquors must so benumb the appetite that it will not crave sufficient food to keep the system in its best working condition.

The classes who are poorly fed, half starved, are apt to indulge excessively in alcohol.

It is chiefly the poorer and laboring classes—mechanics, artisans, draymen, stevedores, and the like, who breathe impure air, in close tenant-houses, whom poverty compels to subsist on meagre and insufficient food—that particularly appreciate the need of the “accessory or *negative* food” supplied by alcoholic stimulants. They find by experience that, under the depressing circumstances in which they live, move, and have their being, they can work harder and longer with their glass of beer, or perhaps of whiskey, than without it. It is a matter of fact, which very few recognize, that most of the liquors are used by the poorer and laboring classes.

This fact, that the lower orders of society are the chief consumers of ardent spirits, is of such vital import in the study of social economy, that it is hard to understand why it has been so strangely ignored. New York City consumes an immense quantity of fermented and distilled liquors—more especially the beers and whiskey—but the greater portion of it is used by the occupants of the tenant-houses.

Indeed, most of our grog-shops are located in those quarters of the city that are frequented by the ignorant and the lowly. The intelligent and wealthy do indeed keep wines and brandies in their houses—and there are a small minority who use them regularly and freely at dinner, or on other occasions are habitual and it may be excessive drinkers—but take the country through, the lower orders of society, in proportion to their numbers, use far more of intoxicating drinks than the intelligent and cultivated.

Very many experiments have been made in order to determine in what way stimulants and narcotics thus sustain the system and take the place of positive food.

It is the opinion of many able physiologists that stimulants and narcotics—or some of them, at least—*retard the change of tissue*. In nautical language, they “slow the fires” of the system.

Alcohol and opium are now very largely and very successfully used in the treatment of many of the severe fevers and inflammations. They have, in a measure, taken the place of *bleeding and calomel*.

3. *They all are liable to make slaves of those who indulge in them to excess.*

It is an interesting fact, however, that most of the intoxication from alcoholic liquors of civilized lands is confined to the ignorant and low-born.

In spite of all the warnings that have been given to the children of aristocracy, the fact remains, that among the educated and influ-

ential the number of those who go down to drunkards' graves is so exceedingly small, that any isolated case that occurs elicits the deepest interest and sympathy. Among these classes—even among students and graduates of colleges—there are not a few who at some period of their lives occasionally make excessive use of intoxicating drinks, but yet not in such a way as to be grossly intemperate. According to the police reports of New York City, and the valuable statistics of Mr. Halliday, of the Five Points Mission, nearly all of the arrests for intemperance in the Metropolitan district are from the lowest rank of foreigners.

In England, also, gross intemperance is comparatively rare among the educated nobility, but is distressingly common among the peasantry. The truth is, the intemperance of the poor and ignorant is more the *result* than the *cause* of their depressed condition. The logical explanation of this is not difficult. "Accessory food" in the form of whiskey and beers compensates in a measure for the insufficiency of their diet. Moreover, the tonic properties of alcohol temporarily brace them against the evil effects of foul air and damp, gloomy homes. Then again, the classes who are thus unfortunately circumstanced in regard to material comforts are usually still more deficient in moral and mental training, and when once hunger or thirst or weariness has driven them to the bar-room, they have not sufficient moral force to stop when they have supplied the demands of nature; hence follow intemperance and its long catalogue of woes. This is, after all, the natural history of every form of vice. I say, then, that intoxication from alcoholic liquors is pre-eminently the vice of ignorance and poverty. In proportion as communities grow at once wiser and better, in that proportion do they become more temperate. The ruling classes of England during the last century were far less moderate in the use of ardent spirits than the nobility of the present day.

The Roman patricians were almost as great debauchees at their feasts, even on their meagre variety of drinks, as are the common laborers of our day in the ale-houses and corner groceries.

Rome cultivated the minds of her youth, but not their morals—thus the citizens yielded to gluttony and intoxication. The Spartans cultivated both mind and morals, and were paragons of sobriety.

In our day the educated ruling classes of society injure themselves more by tobacco than by alcohol. Among the very highest classes even coffee injures more—though in a very gradual way—than alcohol.

Our people are not able to bear tobacco and coffee, or even



tea, as formerly, or as perhaps their fathers and mothers were able to do.

The types of constitution change with the progress of civilization, and the food and drink must change accordingly. Very many of my patients tell me that they cannot use coffee or tobacco at all, and some are obliged to forego even tea.

Tea is used too strong in this country, and there are thousands of ladies especially who subsist on it too exclusively, and are therefore seriously injured by it. Tea in excess begets nervousness, sleeplessness, dyspepsia, headache, constipation, hysteria, and all forms of nervous disorder. Its evil effects come slowly, but they often come too surely. Coffee injures more than tea. Coffee and tea are both excellent drinks, and fortunate are they who can use them without injury.

Those who work hard with their muscles in the open air can use tea, coffee, tobacco, more freely than those whose lives are sedentary and confined. During the late war the soldiers and sailors thought more of their coffee and tobacco than of all their other rations.

4. *They vary in their effects in different climates.* Tea is a product of temperate climes, and can be used with about equal benefit everywhere and in all countries, and with no greater injury in one country than another. *It is, however, more largely used in cold or cool latitudes.* The Russians are the greatest tea-drinkers of the world, next to the Chinese. Tea is very freely used in England. In France, Italy, Spain, and Turkey, coffee, in a certain measure, takes the place of tea. In our own country tea is more used in the Northern States and coffee in the Southern.

Coffee is a product of warm climes, therefore it can be used more freely in the torrid and sub-torrid zones than in the colder regions. The nations of the world seem to find this out by instinct, for the inhabitants of hot countries in both hemispheres use coffee very freely, while those of the colder regions in a measure substitute for it tea and alcoholic drinks.

During the late war our soldiers and sailors on the Union side used far more coffee, and probably without serious injury, than they had been wont to do in their Northern homes.

In 1864 and 1865 I was acting for a year and a half as surgeon in the navy, on the blockade in Farragut's squadron in the Gulf of Mexico. When I first arrived at the station,—which was off the coast of Texas,—and, indeed, for a number of months, I continued to abstain from coffee, as all my life I had been obliged to do in the North. Gradually, however, I fell into the habit of the officers

about me, and began to drink strong coffee three, four and five times daily. To my surprise I found that instead of being made nervous, sleepless, and dyspeptic by it, as would have been the case had I indulged even in a single cup at home, I actually improved in my health, and ever afterwards during my stay I persevered in taking the beverage at all my meals, and frequently at habit lunches.

When I returned to the North I was obliged almost immediately to stop my allowance of coffee, and have never since indulged in it. Shortly after my return I met a very intelligent gentleman, who had visited all the Southern States, and who related precisely the same experience in regard to the use of coffee. It is the habit of the Southerners to drink strong coffee on rising in the morning, at breakfast, and during the day as they may wish it. The same customs are observed in the warm countries of Europe.

*Opium* can apparently be used more freely in the warm countries of the East than in other parts of the world. Of the 400,000,000 who habitually indulge in the drug, probably only a comparatively few are ruined by it. Medical travellers in the East report that opium eating does not usually have as marked injurious effects on the inhabitants as it does with us. There are, of course, thousands who there use it to enormous excess, become slaves to it, and are made wretched indeed.

It is not possible that opium-eating will ever become a national habit in America. Of the 100,000 in this country who are said to use it, nearly all first resorted to the drug as a relief from pain. In Europe and America our tobacco, our tea, and our various forms of fermented and distilled liquors have saved us, and will continue to save us, from the opium-eating habits of the East.

*Alcohol* is a product of both temperate and warm climates, and can be used in all the latitudes. It seems, however, to be most injurious when excessively used in extremely hot or extremely cold climes. Nearly all travellers agree that in the polar regions or in the tropics more injury than benefit results from a large amount of alcohol in any form.

*Tobacco*, like tea, is a product of temperate latitudes, and like tea it can be used without any special or markedly observed differences of effects in all countries. Like tea, it can be indulged in with comparative impunity in the regions of the tropics and of the poles. All the injurious, all the beneficial, and all the negative effects of tobacco seem to be about equally observed in all latitudes. If there is any difference whatever in its effects in the various climates, it is this, that it can be used most freely in those which are warmest.

5. *They all vary in their effects on different constitutions.*

*Chocolate, cocoa, shells*—all these are mild drinks, but there are those to whom they are positively noxious.

*Tea* acts very differently with different temperaments. I know a man who is so exceedingly sensitive to this beverage, that even a cup of the very weakest tea will keep him awake all night. I know many who cannot habitually use tea in any shape. On the other hand I know many—and so do we all—who can take several cups daily of the very strongest tea without showing any effects from it.

*Coffee* is terribly poisonous to very many, especially in our northern latitudes, while others can indulge in the charming beverage to an almost unlimited extent. I am convinced that the number of those among us who cannot drink coffee is increasing. I account for this by the changes being made in the type of constitutions. We are growing more impressible, more nervous, and more sensitive to those drugs and agents that directly affect the nervous centres. I doubt whether more than half of those in this country who lead sedentary and confined lives can habitually use coffee with impunity. Those who labor hard with their hands out-doors can use it more freely.

*Opium* very rarely has the effects described in De Quincey's "Confessions of an Opium-Eater." Even those who use it to enormous excess do not usually experience any of those dreamy visions which his gifted imagination has pictured in such brilliant and hideous colors. Opium varies in its effects even when given in small doses. The majority are put to sleep by it, but some it keeps wide awake. There are those whom it makes actually raving.

*Alcohol* varies in its effects with different constitutions. There are *many hundred different* forms of fermented and distilled liquors now in use in the world. The differences between these are very wide.

The strongest whiskeys, brandies, rums, gins, &c., contain over *fifty per cent.* of alcohol. The stronger wines—port, madeira—contain from *ten to twenty per cent.* of alcohol. The weaker, lighter wines, as hock, claret, Burgundy, champagne, contain from *five to ten per cent.* *Ales, porter, and cider* contain but from *three to six per cent.* of alcohol.

It is manifest at a glance that these different forms of alcohol must not only vary widely in their effects, but also in their effects on the same individual; for besides the alcohol, all of them contain *other important substances, on the proportions of which their influence on the constitution must very materially depend.* Some can drink claret, Rhine wines, hock, cider, beer and porter, and



are unable to use rum, gin, or brandy. Some can drink beer, but not cider. Hard cider with many makes the head ache. For others it clears the digestion, corrects the liver, and sharpens the appetite. Gouty patients are oftentimes unable to take a drop of champagne, or acid wines of any kind or in any quantity, without paying terrible penalties. Many who cannot use brandy, even when largely diluted, find that claret, Burgundy, and even champagne, give them no discomfort.

There are no special rules to guide one in the selection of wines. If one feels that he must use wine, let him find out by *experience* what kind serves him best. As a rule, claret and Rhine wine agree with more persons than any other kinds of wine that reach this country. There is no question, however, that wines are luxuries and not necessities for us, and that life and health can be perfectly maintained without them. One of the strongest arguments in their favor is, that they keep us from abusing ourselves with stronger liquors, and with other and more potent forms of accessory food, such as tobacco, opium, and coffee. But tea and coffee, opium and tobacco, are, strictly speaking, luxuries, although in our modern civilization they have long been deemed as actual necessities. There is no question that health and life, at least in individual cases, can be maintained without any of these substances.

*Tobacco* varies wonderfully in its effects with different individuals. With many the first whiff of a cigar is disagreeable, and the first "cud" absolutely nauseous; but there are very few who cannot become so accustomed to the drug as to enjoy it. I must, however, plead an exception.

Tobacco dries up some, fattens others. In some it causes dyspepsia, in others it relieves it. Some use it to keep awake, others to promote sleep. With all persons, or nearly all, it has a tendency to diminish the appetite, and within certain limits to take the place of ordinary food.

Persons who have been slaves to tobacco very often suddenly or gradually break up the habit; the results are of the most opposite character. Some at once improve in health, grow fatter and stronger; others at once go backward, and grow thinner and weaker. It constipates some and relaxes others.

On many it produces all the horrors of extreme nervousness. Some it makes brilliant, others it stupefies.

Some take a smoke *before* going to battle, to fortify them for severe and unusual effort; others take it *after* the battle, when their effort is completed, to calm their nerves and soothe them to slumber.

6. *They vary in their effects at different ages and times of life.*

The reason of this is quite apparent. The constitution varies at different times of life. The size and quality of the brain, of the muscles, of the bones, vary wonderfully between infancy and old age. A youth of twenty-one is a different being from what he was at the age of one year. A man in middle life is a different being from what he was at twenty-one. An old man at seventy is a very, very different being from what he was at middle life.

It is very clear, therefore, why our food acts differently with us at different periods of our life. Our food is almost a constant quantity. It does not vary much in its quality from year to year, while our bodies into which it enters are ever changing. As with ordinary food, so with stimulants and narcotics.

Many who have been accustomed to indulge, as they desired, in tea, or coffee, or tobacco, or chocolate, or in some form of fermented or distilled liquor, find sometimes that they are obliged to discontinue the use of some one or all of them. The rule works both ways. I have had patients who have found by trial and experience that they could use with impunity, and perhaps with benefit, stimulants and narcotics which formerly were exceedingly injurious to them.

There are many who are obliged to abstain from coffee all their lives until they reach old age, when they find, to their great surprise, that they can use it freely. Probably this experience would be repeated more frequently if people only made trial of themselves in this respect every year or two during their lives.

*Infants should not habitually use stimulants and narcotics.* Those who are growing need positive and not negative or accessory food. Their tissues need to be changed rapidly in order that the growth may be carried on. In infants the brain and nervous system is but little used, and therefore but little needs the aid of stimulants and narcotics. The intuition of the people everywhere is opposed to the use of these substances by very young children.

For the same reason, *children and youth should not use stimulants and narcotics until they arrive at years of discretion.*

There are two very decided arguments against the use of tea, coffee, tobacco, fermented and distilled liquors, by those who are under fifteen or twenty years of age. *First*, they do not at that time need *negative* food, but on the contrary as much positive food as they can digest. Growing children need fresh meat, with fish, oysters, good vegetables, wholesome fruit, and all in a palatable variety. They do not need anything that will interfere with the rapid changes of tissue that always accompany the growth of the

body. *Secondly*, children and youth have not sufficient self-control and force of mind to use these substances without becoming in a sense slaves to them.

It would be better for the young and growing generation if they abstained entirely, or nearly so, from tea, coffee, until fifteen or twenty years of age, to say nothing of tobacco, fermented and distilled liquors. Our children drink tea and coffee too young, and in too large quantities. Like all of us, they take their *tea too strong*. The best drinks for children are milk, cocoa, and water.

Still further, *if young men would abstain entirely from tobacco and alcoholic liquors until the age of twenty-five or thirty, intoxication and all forms of intemperance would be almost unknown by the next generation.*

*Intemperance in the use of tobacco and alcohol is usually the result of habits formed in youth, or before the age of twenty-five or thirty.*

On the other hand, persons of mature age, and especially those in the decline of life, are usually benefited by a reasonable indulgence in tea or coffee.

In the very aged the digestion is often weak, and therefore the sustaining power of stimulants and narcotics is especially grateful. Tea is pre-eminently the drink for the aged. Undoubtedly there are many even among old people who injure themselves by tea, coffee, as well as by tobacco and alcohol; but the proportion of persons over sixty who thus injure themselves is very small indeed in comparison with the thousands of youths who are undermining their manly vigor and impairing their prospects for usefulness by indulging in these forms of negative food.

7. *They are nearly all liable to be adulterated.*

*Tea* is adulterated with at least twenty-five different herbs or imitations that more or less closely resemble the original article. Green teas are adulterated in China, according to Mr. Fortune, by adding to them various coloring substances. Prussian blue and gypsum are much used for this purpose. The Chinese never drink the adulterated teas, but sell them to foreigners, because they bring a higher price. Indigo is also used for the purpose of adulteration. Tea is also much adulterated with what is called "lie-tea," which is composed of the sweepings and dust of the warehouses.

*Coffee* is largely adulterated with chiccory, as everybody knows. Chiccory itself is adulterated with Venetian red, and the Venetian red is adulterated with brick-dust. (See chapter on *Adulterations*.)

*Fermented and distilled liquors* are adulterated in thousands of



ways; even pure *hard cider* is difficult to obtain in our cities. Much of the cider that is sold in the saloons is made of sugar, water, and tartaric acid. Sometimes I have searched for a long time in New York, and in many different stores, for pure hard cider, and without avail. The bottled cider is very apt to be impure. Sulphite of soda and other chemicals are mixed with it in order to preserve its sweetness. It is very unfortunate that it is thus difficult to get pure hard cider, for it is a most valuable beverage. It is usually an excellent drink for the nervous and dyspeptic. It is the Rhine wine of America, and better, far better would it be for our American ladies if they took more hard cider and less tea and coffee.

*Malt beer* is adulterated with *cocculus indicus*, tobacco, sweet flag, sweet gale, yarrow, and thorn-apple. The Javans adulterate their rice beer with cakes, made of onions, black pepper, and *capsicum* (Johnston). It is *not* adulterated with *strychnine* to any extent.

*Wine* is adulterated with poppy-heads, and in myriads of ways that it is not necessary to mention.

Pure wines can be obtained in this country from California, and also from Europe, by those who will take special pains and make the matter a study. In wine-making countries the pure article is as common as water. It may yet be so with us. The introduction of pure wine into our country would not cure intemperance, though it might diminish its horrors. Intemperance is the vice of poverty and ignorance, and can only be driven from the land by the introduction of *knowledge*.

*Ardent Spirits*,—rum, gin, brandy, and whiskey,—as everybody knows, are adulterated to a most fearful degree. Even those who pay the highest price are by no means sure that they obtain the pure article. All of these drinks are manufactured from chemicals.

According to the recent analyses of Prof. J. C. Draper, fusel oil and other bad ingredients are found in highest-priced liquors, and in the most aristocratic hotels and saloons of New York City. These adulterations are not all, however, of such a kind as to seriously injure the health, but all of them are less beneficial and more injurious than alcohol. The rums, gins, whiskeys of the poorer classes are horrible mixtures, and thoroughly deserve their well-known title—"chain lightning." *Much of the intemperance of the poorer classes is produced not so much by alcohol as by cocculus indicus.* It is a terrible substance, and is terribly pernicious. It is largely used in the adulteration of beer.

But, after all, it is an exaggeration to say that pure or nearly pure liquors cannot be obtained in this country. However it may have been in the past, *there is no question that at the present time it is entirely possible to obtain pure wine, and nearly pure liquors of some other kinds, provided we go to the proper authorities* in such, and make the matter a special study. They will, at least, be about as near to absolute purity as our tea, our coffee, or our tobacco. Brandy and champagne are very rarely found here in absolute purity.

The *Boston Journal of Chemistry*—a good authority—says that thousands of gallons of claret are made by allowing water to soak *through shavings*, and adding thereto a certain *portion of logwood and tartaric acid, and a little alcohol*. Good judges can hardly tell the difference between this mixture and the genuine article.

This is unfortunate, for good, pure claret is one of the best of our wines, and is the least liable to injure.

Hoskins gives the following prescriptions for manufacturing liquors :

“*Sweet Cider*.—Imitation: Water, 100 gallons; honey, 5 gallons; catechu, powdered, 3 ounces; alum, 5 ounces; 1 quart of yeast; ferment for 15 days in a warm position in the sun. Then, bitter almonds, half a pound; burnt sugar, one quart; 3 gallons whiskey; if acid predominates, correct by addition of honey; if too sweet, add sulphuric acid to suit taste.”

Another recipe by the “*Bordeaux Guide*” is, in accordance with his avowed principles, harmless:

“To 8 galls. soft water.  
8 lbs. N. O. sugar.  
7 oz. tartaric acid.  
1 qt. yeast.

“Put the ingredients into a cask and stir it up. After standing 24 hours with the bung out, bung it up close, add 1 gallon spirits, and let it stand 48 hours, after which time it is ready for use.

“*Port Wine*.—Cheap cider or claret, twenty gallons; honey, two gallons; carbonate of soda, twelve ounces; strong tincture grains of paradise, one and a half gallons; powdered catechu, 5 ounces; color with a strong tincture of logwood and a small portion of burnt sugar. The reader observes that this wine is made without the addition of any spirit, though a small portion would greatly improve it. The object of the carbonate of soda is to neutralize a portion of acid in the wine or cider, which, if allowed to remain, would present too large a proportion of acid for good port.

“*Sherry*.—Cider, two gallons; bitter almonds, four ounces; honey,

one gallon; mustard, four ounces. Boil for thirty minutes and strain, then add spirit of orris root one half pint, essence of cassia two ounces, and rum three quarts.

“Jamaica is preferable, as this wine, when made from this formula, is often prepared for the *auctions*. The amount of neutral spirit added becomes an important item owing to the cost. When this is kept in view the tincture of grains of paradise should be substituted for spirit.

“The *volatile oil* is produced in excess during the distillation of brandy, only a portion of it being dissolved by the spirit. It is imported into this country under the name of ‘Oil of Cognac,’ and possesses a strong, pungent, and disagreeable taste and odor. On it chiefly depends the flavor of brandy.

“*Acetic acid* is pure concentrated vinegar. *Acetic ether* is a combination of acetic acid with alcohol. It has a pleasant, diffusive, and somewhat fruity smell, and a cooling, agreeable taste. Nitrous ether, or ‘sweet spirits of nitre,’ is often used in flavoring spirits as a substitute for acetic ether.

“*Cenanthic ether* is an oily, fragrant, and volatile liquid. From it brandy derives most of its peculiar odor. This, like the cognac oil, is imported from the wine-making countries specially for use in preparing artificial brandies.

“*Tannic acid*, or *tannin*, is the vegetable astringent principle existing chiefly in the bark, seeds, and wood, and sometimes in the sap and fruit of vegetables. In genuine brandy it is principally derived from the seeds and skins of the grape, and from the wood of the casks in which it is kept.

“*Cognac Brandy*.—To forty gallons pure spirits add two to three ounces oil cognac (dissolved in alcohol), one and a half pounds loaf sugar, two ounces cenanthic ether, two ounces acetic acid, and two ounces tincture of kino. To this add from five to ten gallons of the brandy to be imitated. Let it stand about eight or ten days. Color it with burnt sugar, using a sample of the kind to be imitated as a guide. If you desire a higher flavored brandy, use more of the cognac oil; if a higher odor, more cenanthic ether; if softer and richer, more sugar; if stronger, increase the proof of the spirit by adding strong alcohol.

“*New York Brandy*.—Filtered whiskey, twenty gallons; clear water, seventeen gallons; tincture of Guinea pepper, one and a half gallons; tincture of pellitory, one pint; strong tea, one gallon. Color with burnt sugar and red saunders, and add four ounces of nitric ether and half a gallon tincture of prunes.”

Tobacco is very much adulterated.



According to Pereira, molasses, sugar, and honey are used to increase the weight of tobacco, and also to make it more palatable. The leaves of the rhubarb, the beech, the walnut, mosses, bran, beet-root dregs, liquorice, rosin, yellow ochre, fuller's earth, sand, saltpetre, common salt—all these substances have been detected in tobacco.

Our ordinary articles of food are likewise adulterated. It is difficult to obtain pure groceries of any kind. It is unfair to claim that all the adulteration of the country is confined to the dealers in stimulants and narcotics. The same difficulty is felt across the water.

8. *They all may be used so as to directly injure the nervous system.*

Tea is one of the mildest of the stimulants, and yet there are thousands who are injured by it. Coffee injures more constitutions among the leading classes of American society to-day than all the forms of alcohol combined. It would be better for our American ladies if they would use less tea and coffee—much less—and more cider, sour wines, and good beer.

It is a very significant fact that the men of America—even those who indulge freely in tobacco and in fermented and distilled liquors—are much healthier and stronger than our women, who rarely use these substances, but use more tea and coffee than their lords. The complicated question arises, Why is this so? Is it not, at least, probable that our wives and mothers would be stronger if they would use less tea and coffee, and more cider, beer, and wine, like the Germans, French, and English?

*Coffee* injures thousands. Only a fractional portion of those who lead sedentary lives in America can drink it habitually all their lives. It can bring on every nervous symptom imaginable.

*Tobacco* is capable of producing nearly every possible nervous symptom. *Dyspepsia*, *hypochondriasis*, *neuralgia*, *sleeplessness*, are sometimes caused by it.

*Tea and coffee* give rise to the same disorders even more frequently than tobacco. Insanity has been charged upon tobacco, and it has been stated that the increase of insanity in our modern civilization is largely due to the increase in the consumption of tobacco. This statement cannot, however, be proved, and is not at all probable. *There is an immense amount of false reasoning on this subject.* A person who has been in the habit of using tobacco is taken insane. Some of his friends, who may not themselves use tobacco, and who regard chewing and smoking in public as breaches of etiquette, as they truly are, at once give out that his insanity was caused by

tobacco. This inference they have no right to make. They might with just as much propriety have charged his insanity upon the tea or coffee, or cider or beer, which he may very likely have been in the habit of using.

They might even have charged it upon his daily food, for there is no question that bad diet often brings on nervous diseases.

*The truth is, that no one has a right to charge the nervous diseases—insanity, or any other form—of any individual upon any special kind of diet, or of stimulant or narcotic that he may have been in the habit of using, without overwhelming evidence and after the most careful study.* It is indeed extremely difficult for a physician—whose life is devoted to the study of disease—to decide in any given case of dyspepsia, neuralgia, paralysis, hypochondria, sleeplessness, debility or insanity, whether the symptoms were or were not brought on by the tea, the coffee, the tobacco, or the alcohol that the patient has been accustomed to use. The newspapers report at times that tobacco has caused death. Some of our books on hygiene declare that insanity has increased of late years in direct proportion to the increase in the use of tobacco. Now it is impossible for one not a physician to *tell in any given case whether death has been caused by tobacco, or by tea, or by coffee, or even by alcohol, except in very marked cases indeed.*

Therefore, all such reports are unreliable. Precisely so with the relation of insanity to the use of tobacco. The question is a very, very complicated one, and cannot so easily be answered. It is true that insanity has somewhat increased of late years—though not to the extent that is commonly supposed. It is also true that the consumption of tea, of coffee, of tobacco, of alcohol, and of opium has greatly increased in our civilized land. Shall we attribute the increase of insanity to the tea, the coffee, the tobacco, the alcohol, or the opium? We see at once that the question is very difficult to answer.

Still again, there has been a wonderful increase in the cares, the labors, the anxieties, the passions, and the strifes of our modern civilization. Over-work and over-worry of the brain are the great causes of diseases of the brain. But, after all, it appears from statistics recently published that insanity has not increased to the extent that is commonly supposed.

That nervous diseases in general have increased, there can be no question; but this increase is probably due more to the passions and strife of our modern civilization than to the use of any special article of food or drink.

*Alcohol, when used in large quantities and for many years, un-*

*questionably injures the brain and nervous system. This view is confirmed by actual examination of the brains of those who have died drunkards.* Alcohol also injures the liver, the stomach, and indeed the whole system. There is, however, great liability to err, just as in the case of tobacco. Because a man who has been addicted to alcohol dies, even in his prime, of some disease of the brain, stomach, liver, or other vital organ, we are by no means always justified in convicting him of death from alcohol. So many causes are continually acting upon us that the question is a very complex one, and can only be answered after careful study and close investigation by some professional authority.

There are two well-known diseases that come from the abuse of alcohol. They are *delirium tremens* and *chronic alcoholism*. The symptoms of the former are well known, and need not be here repeated.

The symptoms of *chronic alcoholism* are (according to Marcet)—

1. Inability to sleep.
2. Trembling.
3. Giddiness and headache.
4. Hallucinations.
5. Weakness.
6. Difficulty of breathing.

All of these symptoms may come from a thousand other causes besides the abuse of alcohol, and in any given case it is impossible even for a physician to settle the question without very close scrutiny. Of late years much attention has been given to the reformation of drunkards. It is now well understood that *intemperance* is very often a symptom of *insanity*. It is a kind of *mania*, and has been honored with various special names—"dypsomania," "methomania," "vinomania," &c., &c. This *mania* may be the *result* or the *cause* of intemperance. Long-continued abuse of alcohol may so injure the brain that the victim becomes insane on that subject, and is unable to control his appetite. On the other hand, insanity, however produced, may give rise to intemperance.

In either case the patient should, if possible, go to an inebriate asylum. This disease, if taken early, and well managed by skilful hands, is nearly as curable as any form of insanity. The State reports of the asylums are very encouraging. *Much of the intemperance of our time, especially among the educated classes, is the result of insanity, and should be treated accordingly. The pledge never saves such patients. For such total abstinence is a duty. If they cannot control themselves, let them, if possible, go to an asylum.*



*Opium*, when used habitually and for a long time, produces worse effects than tea, or coffee, or alcohol, or tobacco.

These effects have been very forcibly described by De Quincey, and in the work recently published, entitled "*The Opium Habit*." All of the writers on the subject are, however, inclined to exaggerate the horrors from which they have suffered. Thousands take opium and take it habitually, and take it in large doses and for a long time, and yet never experience the dreams of De Quincey, or the sufferings depicted in the "*Opium Habit*."

The results of opium-eating must depend, and very manifestly, on the temperament. That opium is the most powerful for evil of any of our common stimulants and narcotics, all will admit. If the habit of opium-eating were to become universal in our climate, I should tremble for the results. I have no fear that we shall ever be thus afflicted. Our tea, our coffee, our tobacco, our large and abundant variety of fermented and distilled liquors, every year improving in quality, will undoubtedly continue to save us from the horrors of opium in the future as they have done in the past.

I am inclined to forgive tea, coffee, tobacco, and alcohol whatever evil they have wrought in the world, for this one great redeeming benefit—that they have, in a good measure, delivered us from the opium-eating habits of the East.

Opium-eating, like the use of alcohol, is often a symptom of disease of the brain. Like chronic alcoholism, it may be either the result or the cause of mental disease. This affection, which is, I am happy to say, quite rare in our country, is called *opio-mania*.

9. *They have never been successfully prohibited by law.* A complete history of the attempts that have been made in various countries to prohibit or regulate the sale or use of stimulants and narcotics would be exceedingly interesting.

Law has been directed not only against alcoholic liquors, but also against opium, against tobacco, and against coffee.

The government of China used vigorous and desperate measures to prevent the introduction of opium in that country, but it failed.

Opium, however, has been less opposed by law than tobacco, and possibly that may be one reason why it is less used at the present. Always and everywhere the breeze of opposition fans the flame of enthusiasm, and it is as true now as in Bible days, that bread eaten in secret is pleasant. Nothing advertises a substance so thoroughly as to oppose it by law.

It is with stimulants and narcotics as with books. The more widely and severely are they criticised, the better the sale.

*Tobacco* made trouble everywhere, and has fought and triumphed in more battles than any other stimulant or narcotic.

King James I. of England wrote, as everybody knows, a terrible counterblast against it. In the beginning of the seventeenth century, Abbas, the first Shah of Persia, "proclaimed that every soldier in whose possession tobacco was found would have his nose and lips cut off, and afterward be burnt alive." One of the Sultans of Turkey—Amurath IV.—made the use of tobacco a capital offence. Another Sultan ordered that every one who was caught in the act of smoking "should have his nose pierced with his pipe." One of the Czars of Russia punished smokers with the bastinado and the cutting off of the nose. A bull was thundered against the habit of smoking and snuff-taking in church by Pope Urban VIII.

*Alcohol* has been regulated and prohibited in every way conceivable. The history of the laws that have been enacted against this substance would make a volume.

The recent enactments that have been made in this country—our prohibitory and license laws—are very familiar, and need not be cited.

*Coffee* also has triumphed over great opposition. In Constantinople the priests used all their influence against it, but in vain. In France, Madame Sévigné—a high literary authority of the time—tried her best to prevent the popularization of the beverage. In London, also, coffee found virulent enemies, but there, as everywhere, it triumphed over all.

From a very interesting paper in a recent issue of "Appletons' Journal" I extract the following. We see that our good forefathers also were unsuccessful in their legislative attempts against stimulants and narcotics, even under the most favorable circumstances.

"In the good old times of which we write, it is evident that the evils of intemperance were as great as they have ever been in any portion of our history. Mr. Winthrop complains bitterly of the amount of hot drinks consumed by the young people on board the *Arbella* during the voyage from Southampton to America; and every art of legislation was devised to check the ravages of this vice, short of absolute prohibition, or any restriction upon the *private* use, by the more respectable members of society, of what is sometimes termed in the statute 'the good creature of God.' Mr. John Josselyn, gent., who visited Boston eight years after its settlement, says: 'I found two houses of entertainment, called ordinaries, into which if a stranger went, he was presently followed by one appointed to that office, who would thrust himself into his company

*uninvited*, and, if he called for more drink than the officer, in his judgment, thought he could soberly bear away, he would presently countermand it, and appoint the proportion beyond which he could not get one drop.'

"The custom of 'drinking one to another, which draweth the abominable practice of drinking healths,' is positively forbidden by law. Among the reasons assigned by the General Court for this order, are the following:—

"'1. It was a thing of no good use.

"'2. It was an inducement to drunkenness, and occasion of quarrelling and bloodshed.

"'3. *It occasioned much waste of wine and beer.*

"'4. It was very troublesome to many, especially the master and mistress of the feast, who were forced thereby to drink more oft than they would.'

"Drinking with disreputable associates, more especially if it was not accompanied by judicious and timely remarks on the evils of intemperance, also appears to have brought the offender under the reproof of the magistrate. Thus 'Benj. Hubbard is solemnly admonished of his failing for being in company with James Brown and the rest, and often drinking of the strong-water bottle with them, *and not reproving them.*'

"A man, convicted of drunkenness in the year 1633, was sentenced to attend every day upon the session of the General Court, and in their presence wear the ominous scarlet cloth, with the letter D inscribed upon it. The thought will here suggest itself, whether some such exhibition as this might not have a salutary effect upon our modern representative assemblies, and also whether the general aspect of these bodies would not be somewhat enlivened if the erring *members* thereof were adorned in like manner with scarlet.

"Some time before the transfer of the patent to America, a petition was forwarded to the Massachusetts Bay Company to this effect: 'We especially desire you to take care that no tobacco be planted under your government, unless it be some small quantity for mere necessity and for physic, for preservation of their healths; and that the same be taken privately by *ancient men*, and none other.' It would appear as though 'the ancient men' were a little inclined to monopolize the poisonous weed.

"A few years later, we find that the court felt it to be necessary to relax in some degree the rigidity of the law; for it is ordered 'that no person shall take any tobacco *publicly*; and every one shall pay one penny for every time he is convicted for taking tobacco in any place.' Still later, the law is again modified: 'It is fur-



ther ordered, that no person shall take tobacco privately, in his own house, or in the house of another, *before strangers*; and that two or more shall not take it together, anywhere, under the penalty of eleven shillings and sixpence for every offence.'

"From the tone of legislation adopted soon after this, we may infer that the early settlers of Boston found it as hard to regulate such matters as these by law as their posterity have proved it to be. 'This court, finding that, since the passage of the former laws against tobacco, *the same is more abused than before*, it is therefore ordered that no man shall take any tobacco in the fields, except in his journey or at meal-times, upon pain of twelvenpence for every offence; nor shall take any tobacco in any inn or common victualing-house, except in a private room there, so as neither the master of the same house, nor any other guests there, shall take offence thereat.' Constables are further charged 'to take special notice of common coasters, unprofitable fowlers, and tobacco-takers.'"

I cannot attempt to lay down rules for my readers in regard to the use of stimulants and narcotics, as it would be in regard to the use of ordinary food. In all these matters each one must work out his own salvation with fear and trembling. *The individual experience of every man is a better guide than all the books on hygiene that have ever been written.*

All that I can do in this book—all that any scientific man can do—is to collect and arrange the *general* facts that bear on these subjects; to present the results of scientific study and the experience of mankind. By the light of these facts let each one guide his own life.

If you find by experience that you are positively benefited by any one of these stimulants or narcotics, then use it with the same judgment and moderation that you would use any article of food on your table.

If you find that you are becoming a slave to any one of these substances, disentangle yourself and make yourself master of the situation at all hazards and at whatever cost. You may know that you are abusing your favorite stimulant—be it tea, coffee, tobacco or alcohol—when you find that you are such a slave to it that you cannot possibly do without it.

If, on the other hand, you find by experience that you are injured by any stimulant or narcotic that you may be in the habit of using—*no matter how moderately*—drop it as you would drop a hot coal, and never give it another thought, even though you see your friends about you on every hand using the same substance even more freely than yourself, not only without injury, but with real apparent ben-

efit. In these matters every man must be a law unto himself. Some facts of my own personal experience may be of interest to my readers, and may perhaps help to illustrate the doctrine I am here endeavoring to teach.

At no period of my life have I been able to smoke even the mildest cigar, without experiencing immediate and long-continued uneasiness.

I have frequently experimented with smoking in order to test its physiological effects, and I have always found that, although it gave intensity and clearness to the mental operations, yet its influence on the nervous and digestive systems especially were so pernicious that I feel positive that even a moderate indulgence in the use of the weed for any length of time would undermine my constitution. I therefore totally abstain from tobacco—although I see about me on every hand those who use without injury a number of cigars daily—and although I am well assured that there are thousands who can smoke and chew and take snuff, even to a good old age, without any perceptible injury to themselves or their posterity. The law for them is not the law for me. While the use of tobacco may be right and proper for them, for me it would, with my present knowledge of its effects on my constitution, be a positive crime.

Coffee also affects me injuriously, and in very much the same way as tobacco, though with less rapidity. Therefore I very rarely indulge in it.

Weak tea in very closely restricted quantities seems to have on me only a pleasant effect. I strongly suspect, however, that I should do better to abstain from it altogether, and I should do so, provided I could always be sure of some warm drink of a different kind, or of some quality of acid wine.

Ale and porter, as we find them generally, affect me very capriciously. Therefore I do not habitually use them.

Hard cider and mild acid wines—claret, Rhine wine—almost affect me beneficially, and accordingly I frequently, though by no means regularly, use them. I go for weeks using them almost daily, and again weeks pass in which I do not think of them.

If I could always obtain them I should use them oftener, and take them at meal-time instead of tea or water.

The stronger liquors—whiskey, brandy, and the like, or even the heavier wines, sherry, port—I rarely use, because they seem to do me only harm.

I have presented my personal experience in this detail, in order to clearly illustrate the principles by which we are to be guided in the selection of our stimulants and narcotics.

Every individual is a law unto himself. Just as no human face is precisely like any other, just so no constitution is precisely like any other in its adaptability for special articles of food or drink.

There are those who, on account of the terrible evils of intoxication, desire to abstain entirely from all alcoholic liquors. This is a matter of conscience, with which science has nothing to do. In this luxurious age, all proper encouragement should be given to the spirit of self-sacrifice for the good of others; but we must all admit that those who do thus abstain, no matter how conscientiously, are very apt to do unintentional harm; and, in the words of Hudibras, to

“Compound for sins they are inclined to,  
By damning those they have no mind to.”

I have known scores of active, earnest, and conscientious reformers in the temperance movement, who would pluck out a right eye or give their right hand to be burned rather than touch a drop of fermented or distilled liquors, who yet are grossly and criminally intemperate in the use of tea, of coffee, and tobacco, all of which contain poisonous active principles, while the latter contains *nicotine* and *nicotianin*, in comparison with which the fiercest alcoholic liquors are mild and innocuous.

Indeed it may be said in general that the nervous brain-workers of our modern civilization—our educated classes—are, at the present time, less injured by alcoholic liquors than by tobacco, opium, tea and coffee.

Throughout the land there are thousands of nervous and feeble and dyspeptic men, and especially women, and who, through the habitual use of tea and coffee, are growing more nervous, more feeble, more dyspeptic, who by abstaining from these articles, or by using them in greater moderation, or by wisely substituting for them some pure and healthful wines, beers, or ciders, might vastly improve their own constitutions, and those of their children and children's children.

The only consistent teetotalism is that which abstains from all forms of stimulants and narcotics. The only consistent prohibitory law is that which should prevent the production, the importation, or the sale of tea, or coffee, or tobacco or alcoholic liquors, or opium.

Such absolute teetotalism is very rarely seen among the adult population. In the whole circle of my personal acquaintances, extending through all ranks and grades of society, *I cannot now recall the names of a dozen consistent adult teetotallers.*

Such a consistent prohibitory law has not to my knowledge ever been *proposed or suggested* during all these fierce contests on



the subject of temperance. If proposed, it could never be enacted ; if enacted, no earthly power could enforce it for one day. The great fault of the noble heroes, who in spite of their ignorance and errors have so successfully engineered the temperance reform, is that they have taken *too narrow* a view of the question—have combated some *one* form of stimulant or narcotic, as alcohol, or tobacco, or opium, ignoring the rest. In this way they drive the disease from one part of the body to another, but do not thoroughly eradicate it.

To prohibit stimulants and narcotics from our modern civilization would be as morally impossible as it would be to prohibit the use of beef or bread or fruit. They are woven into and have become a part and parcel of modern society, and will probably continue to be so until that society shall perish from the face of the earth.

But in the next generation they will be used very differently from what they are now. With the progress of civilization and the consequent change in the type of constitution, we must instinctively change our habits in the use of stimulants and narcotics, just as we have done and are doing in the use of our ordinary food. The probabilities are that in the next century our brain-workers, at least in this climate, will use *less* strong tea, *less* coffee, *less* tobacco, and more beers, wines, and cider. Intoxication and intemperance will not necessarily increase with the increased consumption of stimulants and narcotics. *Three centuries ago intoxication, on the average, was far more gross and flagrant than it is now ; and yet during these three centuries the use of stimulants and narcotics has increased several fold more rapidly than the population.*

It is the same with licentiousness. It is a great evil now ; but it was a far greater evil three centuries ago. Both of these giant woes have diminished with the intellectual and moral elevation of mankind. If savage nations could have access to the immense variety of stimulants and narcotics that are found among the civilized, they would be as beastly in their intemperance as they proverbially are in their licentiousness.

In these latter days intoxication has *decreased because knowledge has increased*. The same law will be observed in the future. In proportion as mankind become intellectually and morally enlightened, in that proportion will they become temperate, however freely they may be provided with the different varieties of stimulants and narcotics. As long as ignorance and extreme poverty exist among men, just so long will there be intoxication and all forms of intemperance.

In the twenty-second registration report of Massachusetts for 1866, I find a very carefully prepared table, showing the number and average ages of all persons over twenty years of age, whose occupations were specified, and whose deaths were registered during a period of twenty years and eight months, from May 1st, 1843, to December 31st, 1866. As the number of persons whose occupations and average ages are there given is upward of 95,000, this record is the most important contribution to vital statistics that has ever been made. I append the statistics of the most important representative employments. (See *Statistical Tables*.)

In the eleventh registration report of Rhode Island for 1863, the average ages of those who died during that year in that State are given, with their respective occupations, the ages under twenty being excluded.

As the whole number specified is less than eight hundred, the results are not very conclusive; in some of the trades only one or two cases of death are recorded. I select those that are of the greatest importance in a statistical point of view, omitting all such as do not present a sufficient number of deaths to be of value:—

Occupations.	No. of Per- sons.	Av. Age.
1. Agriculturists.....	147	65.22
2. Mechanics and artisans :		
Blacksmiths.....	13	60.84
Carpenters.....	24	57.37
Jewellers.....	12	39.41
Machinists.....	14	57.85
Shoemakers.....	12	53.91
Weavers.....	10	49.60
3. Laborers :		
Laborers.....	141	48.56
4. Business men :		
Manufacturers.....	10	47.80
Merchants.....	39	54.33
5. Seafaring men :		
Mariners.....	16	38.81

These are all the statistics in regard to the occupations of this country that I have been able to obtain, and are, I believe, all of any importance that exist, or have been prepared in the United States, with the exception of a few observations of the longevity of special classes, which will appear under their appropriate heads.

Let us now compare the reports of the English Registrar-Gen-

eral with that of Massachusetts and Rhode Island. The first registration report of England was published in 1838, since which time there has been continued progress in the system of arrangement and collation.

Dr. Caspar, of Berlin, and Dr. Guy, of London, both wrote on the subject of the relation of occupation to health and longevity; but, inasmuch as very few statistics had at that time been gathered, their speculations are of no great value. Ramazzini and Thackeray gave some advice to artisans by which they might in a measure counteract the evil effects of their callings.

But by far the best work on this subject that has yet appeared on either side of the Atlantic is a small book written by Dr. Thackrah, an eminent surgeon of Leeds, and published in 1832. Although he had few figures to aid him, his book is of great value, both for the compass and accuracy of its general observations, and for the originality and clearness of its ideas.

In 1857, Dr. Neison published a large work on vital statistics, the main object of which was to present the mortuary facts of the friendly societies of England, and also of the medical profession.

Dr. Farr, Registrar-General of England, in his fourteenth annual report, made some important statements in regard to the ages of men dying in different employments. From a careful examination of his tables, I am convinced that they are in the main corroborative of the experience of the registrars of Massachusetts and Rhode Island.

Of those that died in England in 1851, the different classes stand thus in order of mortality :—

1. Farmers.	5. Blacksmiths.	9. Miners.
2. Shoemakers.	6. Carpenters.	10. Bakers.
3. Weavers.	7. Sailors.	11. Butchers.
4. Grocers.	8. Laborers.	12. Innkeepers.

It thus appears that miners, bakers, butchers, and innkeepers experienced the heaviest mortality. In regard to the professions he states that the percentage of death is less or at least not greater than that of the average in all the employments, as we have seen to be the case in this country.

In Dr. Neison's report I find the following table, showing the expectation of life of the clerks, plumbers, bakers, and miners of the friendly societies of England :—

Ages.	Clerks.	Plumbers.	Bakers.	Miners.
20	31.83	36.50	40.02	40.67
30	27.57	30.50	32.35	33.15
40	21.83	24.30	24.07	24.42



## OCCUPATIONS.

*Distinguishing by Occupations (statistically classified) the Number, with their Average and Aggregate Ages, of Persons in the State (in two geographical divisions) whose Occupations were specified and whose Deaths were registered during the year 1866; also in the State (entire) during the period of Twenty-three Years and Eight Months, ending with December 31, 1866.*

[This table includes only persons over twenty years of age.\*]

OCCUPATIONS.	NINE EASTERN COUNTIES, 1866.			FIVE WESTERN COUNTIES, 1866.			WHOLE STATE, Twenty-three Years and Eight Mos. From May 1, 1843, to Dec. 31, 1866.		
	Number of Persons.	Ages.		Number of Persons.	Ages.		Number of Persons.	Ages.	
		Aggregate.	Average.		Aggregate.	Average.		Aggregate.	Average.
ALL CLASSES OF OCCUPATIONS.....	3,718	189,182	50.88	1,501	80,352	53.52	95,918	4,828,120	50.34
I. CULTIVATORS OF THE EARTH.....	562	37,417	66.57	541	35,055	64.80	22,764	1,461,288	64.40
II. ACTIVE MECHANICS ABROAD.....	286	15,612	54.59	68	3,962	58.26	6,893	351,855	51.04
III. ACTIVE MECHANICS IN SHOPS.....	482	22,410	46.49	195	9,314	47.76	9,898	474,399	47.93
IV. INACTIVE MECHANICS IN SHOPS.....	483	21,025	43.52	146	6,335	43.39	10,855	465,594	42.89
V. LABOERS—No SPECIAL TRADES.....	727	37,274	51.27	269	12,994	48.30	17,764	825,852	46.49
VI. FACTORS LABORING ABROAD.....	165	6,771	41.04	40	1,588	39.70	4,978	172,806	34.71
VII. EMPLOYED ON THE OCEAN.....	341	15,856	46.50	2	52	26.00	6,160	279,532	45.38
VIII. MERCHANTS, FINANCIERS, CAPITALISTS.....	460	22,679	49.30	124	5,853	47.20	9,220	445,410	48.26
IX. PROFESSIONAL MEN.....	140	7,284	52.03	61	3,298	54.07	3,316	166,953	50.35
X. FEMALES.....	72	2,854	39.65	55	1,881	34.20	4,070	184,431	45.31
I. CULTIVATORS OF THE EARTH.....	562	37,417	66.57	541	35,055	64.80	22,764	1,460,288	64.15
II. ACTIVE MECHANICS ABROAD.....	286	15,612	54.59	68	3,962	58.26	6,893	351,855	51.04
Brickmakers.....	5	223	44.60	1	34	34.00	65	3,161	48.63
Carpenters.....	140	7,583	54.16	46	2,668	57.96	3,852	197,234	51.20
Caulkers and Gravers.....	9	502	55.77	—	—	—	122	7,156	58.65

	34	1,911	56.20	10	682	68.20	980	48,862	49.86
Masons.....	3	237	79.00	1	61	61.00	91	5,176	56.88
Millwrights.....	2	71	35.00	-	-	-	113	5,780	60.00
Riggers.....	31	2,070	66.83	-	-	-	602	34,408	57.16
Ship-Carpenters.....	5	182	36.40	1	32	32.00	23	368	37.74
Slaters.....	41	1,960	47.80	7	403	57.57	597	27,428	45.94
Stonecutters.....	16	873	54.56	2	84	42.00	448	21,782	48.62
Tanners.....									
22									
III. ACTIVE MECHANICS IN SHOPS.....	482	22,410	46.49	195	9,314	47.76	9,898	474,399	47.93
Bakers.....	15	740	49.33	1	53	53.00	302	13,823	45.77
Blacksmiths.....	50	2,389	47.48	24	1,334	55.58	1,655	87,203	52.69
Brewers.....	3	162	54.00	-	-	-	13	720	55.38
Cabinet-makers.....	27	1,412	52.29	2	99	49.50	493	24,036	48.75
Calico-printers.....	-	-	-	-	-	-	9	469	52.11
Card-makers.....	-	-	-	-	-	-	31	1,406	43.35
Carriage-makers.....	8	346	43.25	1	57	57.00	159	8,001	50.32
Chair-makers.....	1	84	84.00	8	373	46.62	70	2,963	42.33
Clothiers.....	-	-	-	1	80	80.00	63	3,687	56.94
Confectioners.....	3	111	37.00	-	-	-	40	1,619	40.47
Cooks.....	8	280	35.00	-	-	-	68	2,703	39.75
Coopers.....	24	1,383	58.04	2	106	53.00	647	38,278	59.16
Coppersmiths.....	-	-	-	-	-	-	67	3,156	47.10
Curriers.....	8	361	45.12	4	241	60.25	109	4,755	43.62
Cutlers.....	4	198	49.50	3	140	46.67	77	2,984	38.75
Distillers.....	1	69	69.00	-	-	-	20	1,128	56.40
Dyers.....	5	264	52.80	4	190	47.50	94	4,126	43.89
Founders.....	17	783	46.05	11	386	35.09	187	8,356	44.66
Furnace-men.....	5	328	66.50	-	-	-	69	2,944	42.67
Glass-blowers.....	6	284	47.33	-	-	-	93	3,606	38.77
Gunsmiths.....	-	-	-	1	34	34.00	93	10,538	47.68
Hatters.....	13	625	48.07	2	78	39.00	231	14,135	54.79
Leather-dressers.....	6	247	41.16	3	202	67.33	258	4,556	45.56
Machinists.....	71	2,808	39.54	-	-	-	100	49,441	40.09
				28	1,247	44.54	1,233		

\* Soldiers and females excepted.

judiced observation. The doctrine that has for years been taught by the profession and believed by the people is, that in the economy of man mind and body are necessarily at war; that they can prosper and grow only as the nations of Europe can extend their dominions—by infringing on the rights of each other. This doctrine is worse than unscientific; it is a libel on the Creator, who has ordained that body and soul should work together, and be developed in grand and beautiful harmony. God makes nothing in vain, and if a mind of wondrous power is given to man, it is designed that it should be used, and it is also provided that it should be strengthened and not weakened by its own activity; and furthermore, that the body should be benefited and not injured by the growth of the soul it incases. The law is this: *mental activity is healthful; mental anxiety is injurious.*

Let us now look at the special occupations that call for the largest exercise of the intellectual nature.

*Clergymen* very properly demand our first attention. They are in many respects the most prominent of our professional men. In this country they have always taken the initiative in the cause of education and social progress. Moreover, they have always been cited as illustrations of the destructive effects of mental toil, and in the popular mind the ministry has ever been associated with bronchitis, consumption, insanity, and an early grave. Now while it is true that clergymen, in common with all classes of brain-workers, are peculiarly subject to the class of diseases that result from undue activity of the nervous system and vocal organs, it is also true that they are remarkably free from most of the inflammatory affections that carry away our mechanics and laborers before the average term of life is reached. Let it be remembered that the nervous diseases peculiar to literary men, of which so much is said and written, although they annoy existence and cripple usefulness, are by no means as serious in their character as many acute disorders that over-exertion of the physical powers with attendant exposure seem to invite and foster.

The ministerial calling approximates more nearly than almost any other to the ideal occupation we have supposed. The pastor is called upon to use his whole nature. The exercise of the moral faculties of reverence, hope, spirituality, and benevolence is specially conducive to health and longevity—a fact which appears to have been almost wholly ignored by writers on hygiene.

Again the pastor can, if he will, perform his work in calmness and repose. His life is usually free from the unequal pressures, the agitating storms and crises that at times embitter the existence of



speculators and politicians; if he labor in any other than an equable frame, the fault is usually due to himself more than to externals.

Lastly, no one better than the pastor can systematize his time, giving to each day, and each portion of the day, its appropriate work or recreation.

The facts of clerical biography sustain the theories here advanced. Concerning no other occupation are the figures so accordant.

The average longevity of clergymen of all denominations, according to the Registration report of Massachusetts, is 57.79; and 53.80 according to that of Boston alone. In Rhode Island it is 59.25.

Of 417 clergymen whose names are recorded in Allen's Biographical Dictionary, the average age was 65.7; and of these there died :\*

13	between	90	and	100 years.
66	"	80	"	90 "
123	"	70	"	80 "
84	"	60	"	70 "
53	"	50	"	60 "
43	"	40	"	50 "
25	"	30	"	40 "
5	"	20	"	30 "

Dr. Lombard, of Geneva, found the average age of 53 Protestant clergymen to be 63.8, excluding those who died under thirty.

Of 888 clergymen who died in Massachusetts, and whose ages were known,

90 averaged	.....	61.77
124 "	.....	65.00
302 "	.....	62.00
372 "	.....	64.00 †

Of 840 clerical graduates of Harvard College, the average age was 63.62; 41 in each 100 reached 70. Of those dying between 1835 and 1841, the average age was 56.‡

Dr. Madden, in a work on the infirmities of genius, while arguing that the professions in which the imagination was largely exercised were relatively unfavorable to longevity, allows clergymen 70 years.

\* Prize Essay of Benj. W. McCready, M.D., Transactions New York State Medical Society.

† Report of Sanitary Commission of Mass., 1850.

‡ Quarterly Register, vol. x., p. 39.

If, then, there be any truth in statistics, as well as any logic in our reasoning, the prospects of a long life for the minister are exceedingly flattering, in spite of the temptations to excessive work of the brain, and of their manifold bronchial and laryngeal disorders. Among no public bodies do we find more aged and venerable men than in the synods of clergymen.

*Lawyers.*—Of *lawyers* it has been said, that they need a “bad heart and a good digestion.” If this be true, then our pleaders and counsellors are certainly supplied with these conditions, for they stand very high on the tables of longevity. The law is indeed very far from being a natural or ideal profession. The advocate must spend hours and days in the horrible air of court-rooms; the counsellor leads the most sedentary of all lives in his office chair.

On the other hand, law presents a field for the exercise of the largest powers of reason and judgment; as a science, it is pre-eminently intellectual in its character, and is intimately interwoven with statesmanship and diplomacy.

Public pleaders speak long and earnestly, sometimes for days together, but they rarely complain of the clergymen’s sore throat or of anything analogous, for the simple reasons that their tones are more conversational; their briefs are merely used for reference; and, far more than clergymen, they harden the neck to the variations of the atmosphere by a wise and judicious neglect.

The average age of lawyers in Massachusetts is 56.21; in the city of Boston 60.20. It is clear that they do not stand as high as ministers in statistics any more than in theory. Judges live to be 66.38.

*Physicians.*—Medicine is, in some particulars, the most inconsistent and unequal of the professions. In one aspect it is peculiarly conducive to health, in another is theoretically most hazardous. It calls into action the best faculties of both mind and heart; its study embraces, in its totality, the whole range of human thought and feeling.

Moreover, the physician is not alone an operator in bodily injuries, and a prescriber for merely physical diseases; it is his solemn, responsible privilege to

“Minister to a mind diseased;  
Pluck out from the memory a rooted sorrow;  
Raze out the written troubles of the brain.”

—a task that demands his own moral as well as intellectual sympathy and inspiration. In so far, then, as medicine gives scope for the exertion of man’s best faculties of mind, in so far as it quickens and

intensifies the moral nature, in just so far does it approximate to the ideal type of a profession. But there is another side to the picture.

The physician, especially the country practitioner, cannot adjust his hours of labor according to hygienic principles. The life of a faithful, successful practitioner must, then, be one of exposure, anxiety, and irregular toil. The city physician is often able to combine in a most happy manner the physical exercise of daily practice with various study and acquisition; thus marrying, as it were, bodily exercise with a purpose, to the calm pursuit of science—a most fortunate union, that cannot fail to be conducive to vigorous health and length of years.

It is stated on very good authority, that physicians are more than ordinarily subject to cardiac disease, owing to the fact that they are so continually obliged to disguise their feelings and thoughts while in the presence of patients. Whatever of truth there may or may not be in the statement, it does not prevent their attaining a high average longevity.

Of 490 physicians of Massachusetts who died before 1840, the average age was 57, and 35 in each 100 attained to 70 years.\*

In Thacher's Medical Biography (quoted by Dr. McCready) 145 physicians are mentioned, whose average age is 62.8. Of these:

3	died	between	90	and	100	years.
25	"	"	80	"	90	"
37	"	"	70	"	80	"
30	"	"	60	"	70	"
21	"	"	50	"	60	"
18	"	"	40	"	50	"
15	"	"	30	"	40	"
12	"	"	20	"	30	"

It thus appears that 59 of these lived to be over 70, and 100, or more than two-thirds, over fifty.

Of 32 physicians and surgeons whose lives are sketched in Gross' Medical Biography (including several who died before their prime), the average age was 59.

The *farmers* of intelligent districts are properly included in the class of brain-workers. A gulf as wide as the Atlantic separates the husbandman, ruling "*sua arva paterna*," and the common laborer on the farm, hired at so much a week. A stupid or shallow-brained man, devoid of energy or foresight, can no more make a successful farmer than he can make a successful lawyer, merchant, pastor, or physician.

It is a fact generally known that the average longevity among

\* Report of Sanitary Commission of Massachusetts, 1850.



farmers in this country is greater than that in any other occupation. But their green old age is not due to their muscular exercise alone, for mechanics and laborers, who work even harder than the majority of farmers, do not live as long by many years; it is not due to the pure air they breathe, for many outdoor workers are much lower in the scale of longevity than they; nor, lastly, is it due to the calmness of rural life, for the farmer is burdened with grave responsibilities and oppressed often by weightier cares than the workman he hires by the day or month, the butcher in the market, or the teamster on the highway, all of whom die much younger than he.

Farmers are long-lived not only because of pure air, moderate exercise, and country quiet, but more especially because they can counteract the animalizing effects of merely physical labor by varied activity of the mind.

In Massachusetts the average age of 22,764 cultivators of the earth was 64.40.

*Merchants, manufacturers, and men of business* next demand our attention. That the head of any business firm must be a man of intellectual activity and resource, there can be no room for question. Mercantile life, with its myriad complications and crises, makes heavy drafts on the wits and genius of the ablest. And yet the pursuits of commerce, manufactures, and trade do not usually develop the best faculties of man in their entirety; they may be successfully prosecuted without the aid of the moral nature, or the highest capabilities of the mind. The frequent but by no means necessary tendency of commercial life is to sordidness, externalities, and morbid worship of property as the end rather than the means of existence. So far, then, as business life of any kind begets narrowness and greed of gain, just so far is it unfavorable to health. The merchant who is master of his affairs can be measurably systematic in his labor. Moreover, the pursuits of trade will always be congenial to human nature, until the worship of Mammon is less universal than now; and the man of business cannot fail to be inspired by the hope of the bright rewards of his occupation, though at times he may be sickened with its cares and uncertainties. But he is the victim first prostrated by the financial storms which at irregular periods sweep over the land, paralyzing, for the time, the mighty arm of trade. We find business disasters are very frequently the exciting causes of insanity.

But in spite of all drawbacks attendant on business life, merchants are usually healthy, and their average longevity, though below the standard of clergymen, lawyers, or physicians, is greater than that of artisans and laborers.

In the table of Dr. Jarvis, their average age is 48.39 ; in the report of Massachusetts, covering twenty-three and more years, it is 47.95 ; in Rhode Island it is 54.33, while manufacturers are put down at 47.80 ; in Boston, 58.81. The average of all (merchants, financiers, and capitalists) is 48.26.



AN ARTIST.

*Artists and Musicians*, as a class, only cultivate the peculiar gifts they enjoy, ignoring oftentimes the higher intellectual and moral endowments. Whatever in art or music is ennobling, enlarging to mind and soul, serving to make man more intellectual, more spiritual, and more catholic in feeling, must be conducive to health and longevity ; but the great body of musicians in this country, at least, are simply men of special aptitudes, and are oftentimes very irregular and dissipated in their lives. The average age of 101 artists in Massachusetts was 45.19. As a class they are unbalanced men, for the reasons just stated, and, if the statistics of insane asylums are worthy of credence, artists furnish a greater percentage of inmates in proportion to the numbers in the profession than almost any other class.

*Students* in academies and colleges are as healthy and vigorous as any other body of young men of similar ages in the country.

In spite of the late hours, and oftentimes irregular habits of students ; in spite of their excessive use of tobacco, and spasmodic industry, they are, as a rule, both in this country and in Europe, eminently vigorous and healthful. Neither among clerks, mechanics, nor laborers have I seen so pleasant an average of sturdy, wiry, bounding health as among the undergraduates of Harvard and Yale.

*Teachers* of primary schools are not usually over-healthy nor very long-lived, but the occupation of teaching itself is not necessarily injurious. On the contrary, the beneficial effect of the intellectual exercise required in instructing is seen in the gray hairs of our college and academy professors, and managers of private schools. Of 74



STUDENT.

professors mentioned in Allen's Biographical Dictionary, the average age was 61 ; of 22 in Massachusetts, 55.81 ; while of 359 teachers in the same State, the average age is but 39.95.

Why is this discrepancy ? The answer is obvious. Teachers stand low on the list, partly because very few follow teaching as a life calling, but abandon it usually before arriving at maturity ; and therefore of those who die and are registered as teachers, the average age can, of course, be no guide in determining the healthfulness of the occupation ; partly because the duties of instruction in the elementary branches do not call forth the highest powers of intellect, like pleading and sermon-writing ; and partly because they are confined for many hours each day in poisonous and over-heated rooms, subject all the while to multitudinous petty vexations and "insect cares," which, though they are mighty enough to torture the body and fret the spirit, are too insignificant to develop the highest type of character.

*Authors*, as a distinct registered class, are not numerous either in this country or in Europe, but they are scattered through all the professions. Whatever hygienic laws apply to professional men must also apply to authors, as such. It follows, therefore, from what has been said that authorship is favorable, and eminently so, to health and long life.

On the score of congeniality, we may safely assert that no class so love their calling as do authors. Says one : "Of all artists, the poet is most fond of his work ;" and the statement may be extended to embrace all classes of writers.

Unless driven by pecuniary straits, authors can regulate their hours of labor according to hygienic laws. They can systematize their time ; they can think in repose. But authors are usually men



of genius endowed with exalted imaginations, and subject to varying moods and fitful humors. The muse is often coquettish, and will not come and go by clock-work ; fancy will not soar by the laws of arithmetic. It is one of the compensations of genius, that he who possesses it largely must be its slave. The imagination of great souls breaks from the fetters of hygiene, and they cannot restrain it if they will.

It is useless for such geniuses to attempt to regulate their seasons of creating by the chronometer, like the compiler or statistician.

So much has been said of Kirke White, Chatterton, Keats, and others who were similarly unfortunate, and so many homilies have been written on the lessons of their lives, that those who have not investigated the subject will be surprised at the statement that the average age of the poets, essayists, historians, and novelists of England, whose names have been handed down with various degrees of fame, is nearly *sixty years*. If we go back to classic times, we find that Cicero died at sixty-four ; Demosthenes at sixty ; Socrates at ninety ; Virgil at fifty-one ; Tacitus at sixty ; Plato at eighty ; Aristotle at sixty-three ; Æschylus at sixty-nine ; Ovid at sixty ; Livy at seventy-six ; Anaxagoras at eighty-eight ; Zeno at ninety-nine, and Xenophon at ninety ; and if the list be extended to include all the immortal authors of antiquity, the average longevity is still found to be very high. Comparing the different spheres of intellectual activity, we find that philosophers and men of science live longer than poets, or those who are endowed with rich gifts of fancy. Observe the following comparative list :

<i>Philosophers and Men of Science.</i>		<i>Poets and Romancers.</i>	
Galileo.....	78	Virgil .....	52
Franklin.....	84	Dante .....	56
Herschel.....	84	Petrarch.....	70
Newton.....	85	Fenelon.....	63
Halley.....	86	Pope.....	56
Locke.....	73	Molière.....	53
Roger Bacon.....	78	Horace.....	57
Buffon .....	81	Racine.....	59
Harvey.....	81	Milton .....	66
Galen.....	79	Young.....	80
Jenner .....	75	Corneille.....	78
Haller.....	70	Voltaire.....	85
Galvani .....	61	Wieland .....	80
Francis Bacon.....	78		

The causes of this difference are sufficiently obvious. The life

of the philosopher is one of calmness, regularity, and unworried activity of mind ; the life of the poet is often one of excitement and irregular and spasmodic industry, or of absolute dissipation ; the average longevity of the one class is probably between 70 and 80 years.

That even these irregularities and excesses are not of themselves so destructive as is supposed, is proven by the records of literature. With the sad examples of Kirke White, Schiller, Chatterton, Byron, and Poe before our minds, we find that the average age of authors is very high. The average age of the writers of France, Germany, and America, of the past century, will not fall much below that of clergymen. *Journalists* in this country are not as healthy or as long-lived, on the average, as authors, and for very obvious reasons. Those, however, who work regularly and calmly, and obtain a proper amount of sleep, may and do live as long as other classes of literary men.

We seem, then, to be shut up to the conclusion that intellectual activity is not only healthful, but pre-eminently so, and that the effects of the mental excesses of professional men are far more than counteracted by the conserving tendencies of the exercise of the higher faculties.

A corroborative argument in favor of this position is to be found in the fact that *the expectation of human life increases with the progress of civilization*. Although this has been denied by some, there can be little room for doubt to the candid inquirer.

Registrations of births and deaths were kept by the Greeks and Romans, but as they were not preserved, we are unable to compare the different periods of classic history ; but from the tables which have been continued at Geneva with great care for several centuries, we learn that the expectation of life at the present day in that city is *five times* as great as it was in the sixteenth century. The following table represents the rate of increase :

Period.	Years.	Months.	Days.	Rate of Increase.
1551-1600	8	7	26	100
1600-1700	13	3	16	153
1701-1750	27	9	13	321
1751-1800	31	3	5	361
1801-1813	40	8	10	470
1814-1833	45	0	29	521

In round numbers, the average expectation of life at Geneva in 1551 was 9 years ; in 1833, 45 years—a most marvellous increase, and one that is to be accounted for partly by the progress of social science, government, and sanitary knowledge, but chiefly by the

mental and moral activity to which this progress is due. The rate of annual mortality in France in 1781, was one in 29; in 1802, one in 30; and in 1823, one in 40. In London in 1700 the annual mortality was one in 25; in 1781, one in 40.

If, then, there has been a gradual and continual increase in the expectation of life on both sides of the Atlantic, the inference is warranted that such increase is owing very materially to the expanding intellectuality of our modern civilization, as well as to a better knowledge and observance of the laws of health.

The second fact that we learn from the study of vital statistics is this: that *the greater the mental and moral endowments of a man, the greater the amount of intellectual labor he can undergo, and the better his prospects for longevity*. It would seem that those upon whom nature has been most prodigal of her intellectual gifts can work harder and longer, with better expectation of life (other things being equal), than the rank and file of humanity in any of the professions. Although this idea has not been advanced before, so far as I am aware, its truth is, I think, satisfactorily established by analogy and by literary and scientific biography.

Isolated illustrations of longevity among great men are familiar to us all. But we have no right to generalize from a few instances. In order to establish the general principle that the greatest geniuses and hardest brain-workers of the world attain an exceedingly high longevity, we need as many cases as can well be obtained.

I have therefore taken the pains to go through the Cyclopædia, and to note down the ages of *one hundred* of the greatest men of history—those who have created epochs, and have been the leaders of the world's thought in literature, art, science, and statesmanship—and I have found that the average age of these was much higher than that of literary and professional men generally; nay, even much higher than that of clergymen, the longest livers of all. This list, which covers a period of many centuries, contains such names as Goethe, Coleridge, Lessing, Beranger, Wordsworth, Voltaire, Hume, Milton, Shakspeare, Dante, and Irving, among men of letters; Raphael, Michael Angelo, and Reynolds, among painters; Malebranche, Locke, Leibnitz, Hobbes, and Hamilton, among modern philosophers; Socrates, Aristotle, Plato, and Cicero, among the ancients; Harvey, Cuvier, Buffon, Galileo, Humboldt, Newton, Jenner, and Faraday, among men of science; Napoleon, Marlborough, Washington, Metternich, Richelieu, Burke, Webster, Calhoun, and Clay, among warriors and statesmen; and Calvin, Luther, Knox, Butler, Paley, and Edwards, among theologians. No one will deny that these, and similar names, fairly represent the giants of history.



Now, the aggregate ages of the one hundred men on this list was not far from 7,500, giving the astonishing average of nearly *seventy-five years*, which is twelve to fifteen years higher than that of the most favored of ordinary professional men.

Whoever will make the effort to fill out any list of names that thoroughly represent the leaders of the world's thought and activity will, I am sure, arrive at results not essentially different from mine.

In opposition to the facts here presented, it will be said that nervous diseases are on the increase among us, and that they are most frequent and most severe among brain-workers. That this impression is well founded there can be no question. Paralysis, neuralgia, hysteria, dyspepsia, hypochondriasis, and insanity are certainly more frequent, both in this country and in Europe, than they were thirty or fifty years ago. In my own practice, I am continually amazed by the variety and subtlety of phase that these diseases assume even in the young and growing generation. But it is one of the compensations of these nervous disorders that they are not rapidly fatal, and that they *protect* the system against febrile and inflammatory affections that hurry the Indian, the negro, and the poor laborers of our own race into early graves.

*The third fact which we learn from these statistics is, that of those occupations which are not distinctively intellectual, those are most favorable to health and longevity which, on the whole, demand the greatest relative activity of the mind.*

Those mechanics who, like carpenters, carriage-makers, blacksmiths, use their brains as well as their muscles, although they work much indoors, are healthier and longer-lived than shoemakers, tailors, jewellers, and operatives in factories, whose labor is so rigidly systematized that they are obliged to do very little more thinking than the machines on which they are employed.

It should be remembered, also, that a *variety* of muscular activity is more conducive to health than mere routine, that calls into play but a single set of muscles.

*Active mechanics abroad live to be 51.04.*

*Brickmakers* live to be 48.63. This is a very good average. Their occupation admits of a variety of toil, and much of the time they have the benefit of the sunlight.

*Carpenters* attain the age of 51.20. Their trade admits of a variety of toil. Some of the time they are outdoors, and then again they labor in shops. Most of the time they are exposed to the sunlight. All of the principal muscles are called into exercise at various times and in various combinations.

The carpenter, breathing no noxious gases and no poisonous dust, cramped in no narrow position and imprisoned in no heated rooms, is, on the whole, the healthiest of artisans.



A CARPENTER.

*Calkers and ship-carpenters* are also comparatively vigorous, and live a comfortable length of years. Calkers are obliged to labor in a confined position, and the mere exercise of their trade is not stimulating to the mind, nor calculated to develop the whole physical man. That their average longevity is good is due to the pure air they breathe, more than to any other cause.



A COOPER.

*Coopers, carriage and clockmakers, and wheelwrights* are all quite healthful and have a good expectation of life, and for the same reasons that apply to the carpenters and joiners. The journeyman may become an architect, provided he be able and willing to climb the rounds of the ladder, one by one. These considerations act as a stimulus to those mechanics who are not dead to all ambition, and

impel to active thought and strong exertion. In those callings where the chances of promotion are distant and cloudy, we shall see that men become desperate and animalized, while in the same proportion their life-expectation diminishes.

*Grocers* are said to be troubled with a kind of itch, caused by the irritation of sugar and other substances they handle. But although this affection is disagreeable, it is neither dangerous nor fatal. Their life is active, and allows of a wide range of intelligence and energy; while sluggish dotards may exist by the occupation, it yet affords scope for the highest business abilities. They die at 48.03 years.



A BLACKSMITH.

*Blacksmiths* live long, and are not subject to any peculiar disease. Of more than 1,000 in Massachusetts, the average age was 52.69. While their work is hard, it admits of not a little variety. They breathe good air and observe regular hours of labor. The cinders, smoke, and heat are injurious to the eyes, and give rise to chronic inflammations, but have no marked effect on the general health.

*Millers* do not seem to be injured by the dust of flour and meal they continually breathe, although Thackrah distinctly asserts that starch and farina manufacturers are more than ordinarily subject to bronchial and pulmonary disorders. Their occupation is in all other respects healthful and elevating, and they may not improperly be classed as manufacturers. The average age of 186 in Massachusetts was 58.58.

We now come to speak of those employments that are not regarded as favorable to health and longevity, which we find to be by far the largest class, including most of the trades and mechanic arts that attend upon and are a part of our modern civilization.

*Butchers* are proverbially fleshy, bloated, and red-faced. So



*Tobacconists* do not seem to be as much injured by their calling as was at one time supposed. It has been thought that working in tobacco had a bad effect on the health, but this theory is not sustained by sufficient evidence.

It is now proved, both by general observation and by statistics, that *tobacconists* are, if anything, healthier and longer-lived than the average of indoor operatives. In some of the rooms of tobacco manufactories the workmen live in an atmosphere of tobacco dust, large quantities of which they must take into their lungs with each respiration; and yet they become so entirely accustomed to it that they not only are as free from disease as the average of operatives, but are really longer-lived. It is thought by some that working in tobacco protects the system from consumption and fevers, and some other diseases. The average age of 29 *tobacconists* in Massachusetts was 52.17 years. This is *four years* above that of active mechanics in shops, and only four below that of clergymen, lawyers, and physicians, who are noted for their longevity.

*Operators on Sewing-Machines.*—It is said that there are over *one million of sewing-machines* in the United States. All these have come into use within 25 years. This is a short time in which to test the effects of operating these machines on the longevity, and the statistical table on this special occupation sheds no light. Many physicians and other close observers now agree that operating on the sewing-machine for an *exclusive* occupation is injurious to the health, especially of women. In operating on our ordinary machines the body is in a sitting position, and only a limited number of muscles of the arms and limbs are used. The position is cramped and unnatural. The movements required become exceedingly tiresome. A very intelligent lady, of more than average health, once told me that half an hour at the sewing-machine completely exhausted her, and that it made her for the time exceedingly nervous.

Besides the general results, operating on sewing-machines sometimes injuriously influences the genital apparatus, and thereby, by its mechanical effects, may give rise to serious local disorder.

*Finally, we observe that those occupations of women which are allied to and are a part of her duties as wife and mother, and mistress of the household, are more favorable to her longevity than the special trades.*

The average age of 4,070 *females (of all classes)* was 45.31 years.

"	"	"	"	57 nurses	"	61.53	"
"	"	"	"	2,309 housekeepers	"	50.33	"

The average age of	361 domestics	was 46.15 years.
" " " "	195 seamstresses	" 45.81 "
" " " "	154 tailoresses	" 45.16 "
" " " "	37 shoebinders	" 43.84 "
" " " "	147 dressmakers	" 41.90 "
" " " "	29 straw-braiders	" 38.69 "
" " " "	84 milliners	" 38.45 "
" " " "	26 straw-sewers	" 31.92 "
" " " "	205 teachers	" 29.99 "
" " " "	466 operatives	" 28.07 "

It will be observed that there is here a regular gradation—that nurses, housekeepers, domestics, are quite long-lived, while those engaged in the special trades of straw-braiding, millinery, attain only an average age of less than *forty*.



NURSE.

Making all allowances for the fact that *young* women are more apt to engage in these special trades, these facts are yet very significant.

When woman is allowed to participate actively in politics, and in professional and business life, it is probable that her longevity will be increased. Her present duties do not sufficiently exercise her brain. Home duties give more and a better variety of activity to the brain than working in the mills or standing behind the counter, and are therefore more healthful. In proportion as woman uses her fingers less and her brain more, in that proportion, other conditions being favorable, will she become longer-lived.

There is, then, a difference of at least ten years in favor of those

who labor in the household. Stern necessity compels the widows and unmarried of civilized lands to engage in irksome mechanical employments, but it would be far better for woman's health and happiness if the laws of society made it more honorable to wait on the door and preside over chambers than to sew on coats or make straw hats.

Of the relative age of the married and the unmarried, these statistics give us no information.

It has been shown, however, by other statistics, that the *married live much longer than the unmarried*; that widows and widowers have less expectation of life than if they remained all their lives in the married state.

It is a very suggestive argument in favor of the healthfulness of the married state that, in spite of all its necessary cares, and anxieties, and distresses, in spite of its frequent and life-long uncongeniality and misery, in spite of the sorrows of parturition, and all the nameless trials that children cause their parents, yet the married live much longer than the spinsters and bachelors.

This fact is also an argument in favor of the healthfulness of labor of the brain. The brains of the married are usually much more active than those of bachelors and old maids. They have weightier and more numerous cares. They have severer anxieties. The care of the children, the unnumbered duties of the household, the perpetual battle for bread and shelter, the continuous planning and forecasting, the constant activity of the emotional and moral nature—all these things, *on the average*, tend to health and longevity.

On this important subject of longevity, Dr. J. V. C. Smith remarks as follows:

“1st. Short persons, of sound constitutions, unimpaired by violations of natural laws of health, have a prospect of a longer life than tall persons, all other circumstances being equal.

“2d. Females having particularly long necks have shorter chests and narrower at the base than those whose necks are of the ordinary appearance.

“3d. Diseases of the lungs do more frequently exist in tall men than in those of medium height, or those between five feet seven inches and five feet nine; and a hereditary tendency to pulmonary consumption is thought to be found in tall families more frequently than in others.

“4th. When pulmonary disease is hereditary in a family, children are not unfrequently born with tubercles in the tissues of the lungs. Years may be required to develop them, unless they are subjected to some exciting causes. Slight inflammatory action in the



## SURGICAL ACCIDENTS AND EMERGENCIES.

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### THE IMPORTANCE OF SOME SURGICAL KNOWLEDGE TO EVERY PERSON.

THE following directions are not designed to induce the public to usurp the province of the regular surgeon, but merely to put our readers in possession of a few broad principles, and a certain portion of the modes of operation, by which they can calmly face the danger of an accident that involves the question of life or death in a fellow-being, *grapple with it until the arrival of a surgeon, and, when life can be preserved, to preserve it!* No family is proof against accidents. You may, perhaps, be called on, almost at any instant, to listen to the painful intelligence that a calamity of a threatening nature has happened to a member of your own household. Suppose such an one to have severed the main artery of the thigh—an accident entailing certain death, unless aid be immediately rendered—and no surgeon within some miles. The blood is gushing out in torrents from the wound, or he is already at the point of exhaustion! You would go calmly and scientifically to his relief, quiet the tumultuous grief of his surrounding friends, while dexterously applying a bandage which you would instantly construct of your pocket-handkerchief, and coolly put aside the arm of death!

There are accidents of a very common character which require surgical assistance, but which do not threaten life; such, for example, are fractures and dislocations. But even here assistance cannot be obtained too soon; for after the utmost and permanent contraction of the surrounding muscles, which generally takes place in about three-quarters or even half an hour, the reduction is effected with the extremest difficulty, and with inconceivable suffering to the patient; while, accomplished in the first moments after the accident, the adjustment of the displaced parts is comparatively easy, and is accompanied with very little pain. In short, the surgical cases of which we treat are those in which relief may be administered in the first moments, which are the most precious; and that, too, with as much facility, and with as much efficacy, in almost every instance, as if a surgeon were actually present.

*Sea-captains are obliged to know something of surgery. What I shall hereafter say concerning fractures and dislocations will be designed chiefly for them, and for those who like them are liable*

*to meet with serious accidents in places where no physician can be procured.*

#### OF THE MEANS OF ARRESTING A FLOW OF BLOOD.

Whenever an accident occurs, wherein the loss of blood is liable to expose the wounded person more or less immediately to danger, the hemorrhage, or flow of blood, may be always suspended by *applying one or more fingers, according to the extent of the injury, upon the place whence the blood issues, while the other more important means are being prepared.*

These consist of any soft substances which are capable of being rolled up or moulded into the form of a plug, and are to be applied directly upon the open vessel, so as completely to fill up and cover the wound; for this purpose recourse may be had to sponge, German tinder, puff-ball, spiders' web, moistened paper, tow, lint, old and soft linen, wool, or, if in the country, and at a distance from any habitation, even fine moss. But whenever it can be obtained, the preference should be given to sponge, as it can be more easily insinuated into the wound, the interstices of which it fills completely up, by reason of its peculiar structure and its elasticity.

But in order to impart the greatest efficacy to the means just recommended, the clots of blood, if there are any, should be removed, and the wound washed with cold water, in order that the place from which the blood issues may be exposed as completely as possible; the point of the plug ought then to be placed directly upon the vessel, and not upon the clot. The cleansing of the wound alone will often cause the flowing of the blood to cease. The substances thus wedged in should be maintained in their situation by a neckerchief or a pocket-handkerchief, folded in the form of a cravat, a common band, or even a garter. If the means already pointed out should be insufficient to suspend the flow of blood, the whole application should be removed, and the pressure of the finger alone relied upon, until the surgeon, or a person acquainted with the nature and treatment of such accidents, can be called in. The wounded person could manage this himself in case of need.

The pressure of the fingers upon the same place during several hours would suffice to arrest the most considerable hemorrhage; but as this continued pressing, if confided to one person, would become too painful to be long endured, two or three persons should be employed to aid alternately.

If, however, it should be found necessary, from the great depth or extent of the wound, to have the powers of restraining the hemor-



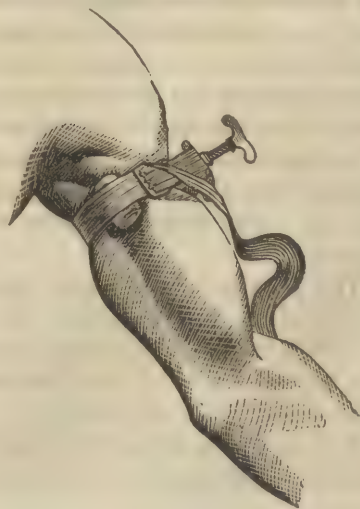
COMPRESSING ARTERY OF LEG TO STOP BLEEDING.



COMPRESSING THE ARTERY OF ARM TO STOP BLEEDING.



STOPPING BLEEDING OF LEG BY TWISTED HANDKER-  
CHIEF.



STOPPING BLEEDING BY APPLICATION OF A TOURNIQUET.



or outside skin; thus protecting the wound securely from the aggravating influence of the air, dust, &c.

Yet the *common* gun-cotton, although partially soluble in ether, and forming a shield analogous to what we have described, is not a perfect preparation. The gun-cotton should be prepared with particular reference to this specific purpose. Otherwise it will leave a deposit upon the wound resembling whitewash; whereas the preparation which we recommend leaves, as we have said, a shield almost imperceptible to the eye.

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## TO RESTORE PERSONS APPARENTLY DEAD FROM DROWNING.

THE DIRECT METHOD OF PROF. BENJAMIN HOWARD, OF NEW YORK,

*As taught under the auspices of the METROPOLITAN BOARD OF HEALTH OF THE CITY OF NEW YORK.*

RULE 1.—*Unless in danger of freezing, never move the patient from the spot where first rescued, nor allow bystanders to screen off the fresh air, but INSTANTLY wipe clean the mouth and nostrils, rip and remove all clothing to a little below the waist, RAPIDLY rub dry the exposed part, and give two quick, smarting slaps on the stomach with your open hand.*

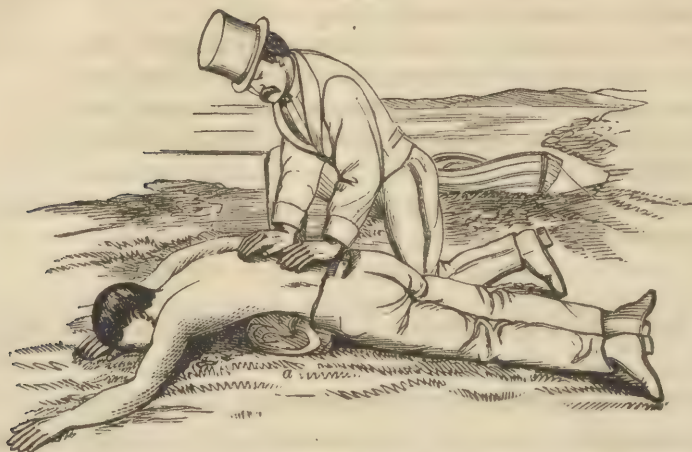
If this does not succeed immediately, proceed according to the following rules to perform artificial breathing:

RULE 2.—*Turn the patient on his face, a large bundle of lightly rolled clothing being placed beneath his stomach, and press heavily over it upon the spine for half a minute.*

RULE 3.—*Turn the patient quickly again on his back, the roll of clothing being so placed beneath it as to make the short ribs bulge prominently forward, and raise them a little higher than the level of the mouth. Let some bystander hold the tip of the tongue out of one corner of the mouth with a dry handkerchief, and hold both hands of the patient together, the arms being stretched forcibly back above the head.*

RULE 4.—*Kneel astride the patient's hips, and with your hands resting on his stomach, spread out your fingers so that you can grasp the waist about the short ribs. Now, throw all your weight steadily forward upon your hands, while you at the same time squeeze the ribs deeply, as if you wished to force everything in the chest upwards out of the mouth. Continue this while you can slowly count—ONE,—TWO,—THREE;—then SUDDENLY let go, with a final push, which*

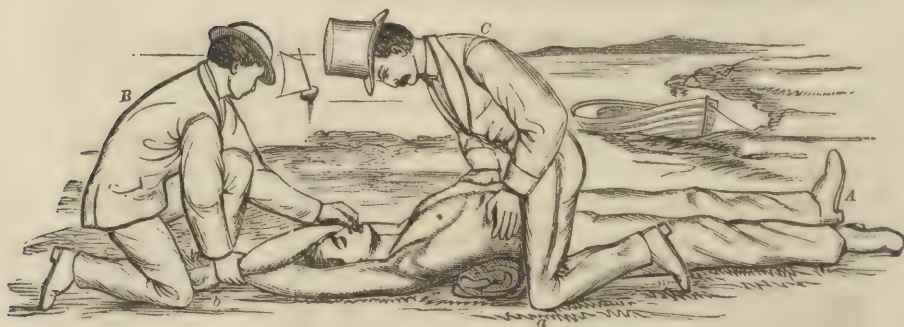
FIG. 1.



MODE OF FORCING AND DRAINING OFF WATER AND OTHER ACCUMULATIONS FROM THE STOMACH, THROAT, AND MOUTH, ACCORDING TO RULE 2, PREPARATORY TO PERFORMING ARTIFICIAL BREATHING.

*a*, Patient's clothing rolled tightly.

FIG. 2.



MODE OF PERFORMING ARTIFICIAL BREATHING ACCORDING TO RULES 3 AND 4.

*A*, Posture of patient according to Rule 3—arms extended backward, and ribs thrown prominently forward by roll of clothing (*a*) beneath back.

*B*, Assistant holding tongue, so as to prevent it falling back into the throat and blocking up air-passages to chest. By using handkerchief or similar article, the tongue cannot slip from the grasp. *b*, Right hand of assistant grasping both wrists of patient, keeping arms forcibly extended backwards. If not available, the assistant may be dispensed with.

*C*, Operator forcing out of chest all foul air, preparatory to the sudden letting-go, which compels an inrush of fresh air, on the principle of the ordinary bellows. The operator may, if he choose, kneel beside the patient, or in case of a child, where little force is required, may conduct the process in any attitude most convenient.

*springs you back to your first kneeling position. Remain erect upon your knees while you can count—ONE,—TWO;—then throw your weight forward again as before, repeating the entire motions—at first about four or five times a minute, increasing the rate gradually to about fifteen times a minute, and continuing with the same regularity of time and motion as is observed in the natural breathing which you are imitating..*

RULE 5.—*Continue this treatment, though apparently unsuccessful, for two hours, until the patient begins to breathe; and for a while after this help him by well-timed pressure to deepen his first gasps into full, deep breaths; while the friction of the limbs, which should if possible have been kept up during the entire process, is now further increased.*

RULE 6.—AFTER-TREATMENT—EXTERNALLY. *As soon as the breathing has become perfectly natural, strip the patient rapidly and completely. Enwrap him in blankets only. Put him in bed in a room comfortably warm, but with a free circulation of FRESH AIR, and except for the administration of internal treatment, let him have PERFECT REST.*

INTERNALLY. *Give a little hot brandy and water, or other stimulant at hand, every ten or fifteen minutes for the first hour, and as often thereafter as may seem expedient.*

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## THE PHILOSOPHY OF THE TREATMENT.

Death from drowning is caused not because of the presence of water as such, but because of the absence of fresh air from the chest.

Whether excluded by water, as in drowning; by a cord closing the windpipe, as in hanging; by dense smoke, as in a burning building; by foul gas, as in an old well, or from escape of ordinary burning gas into a close room; whether by burying the face in a soft pillow, or by a piece of tough meat lodged in the throat, corking up the entrance to the windpipe—in all these cases the immediate cause of death is one and the same.

The BREATH is the LIFE. Let it be shut out from the chest, or anything else be entirely substituted for it, and *suffocation* at once begins, and this continued always ends in *death*.

To avert death, then, and reawaken life in all these cases, you must not begin by giving a little stimulus, or “something reviving,”



as it is called ; not by applying hot blankets, nor putting the patient into a nice warm bed. The first and instant necessity is, if possible, to GIVE *breath* until the patient is sufficiently recovered to be able to TAKE *breath* for himself. This alone can start life again, and maintain it in action. If the draft and door of a stove is long kept tightly closed the fire dies away to an interior spark. If in this condition you begin to put in more coal, your disturbance is very likely to completely extinguish the remaining spark.

To apply heat in any form to the *outside* around the stove would be simply absurd and ridiculous. If, on the contrary, you should open the draft, rake away the ashes and dead coals from the mouth of the draft up to the interior spark, open the damper and set a current of air in motion through the stove, or in a great emergency add a few gentle steady puffs from the bellows, you would be adopting what all experience proves to be the most sensible and only successful way to rekindle your fire to brightness and warmth.

The relation of fresh air to the burning of a fire is precisely what it is to the reviving and continuance of life. Therefore, if the friction, the breeze, and the slap upon the nerves over the stomach, as directed in *Rule 1*, fail to startle and revive the patient, then it is necessary to at once see that the track from the mouth to the chest is clear, so that the passage of air to the chest be not obstructed.

By following the directions of *Rule 2*, fluids accumulated in the stomach, chest, or throat are removed. The stomach, at a greater elevation than any other part of the track, is pressed between the roll of clothing and the spine, whence water or other accumulations have a complete *drainage* down to and out of the mouth, which is the lowest point.

The next step is to induce air to enter the chest by what is called artificial breathing or respiration. *Rule 3* prevents the tongue tumbling back into the throat, to choke it up as by a piece of dead meat, and provides for its tip being kept out and to one side of the mouth. Also by keeping the arms well stretched back, helps to keep the chest somewhat expanded.

The actual breathing is effected by the directions in *Rule 4*. In order to understand this, it must be remembered that the chest containing the elastic lungs is an open-work, ribbed, bony box, which above the bottom of the breast-bone is scarcely movable, except by one's own will, the ribs being fastened both in front to the breast-bone and behind to the spine. The ribs below the breast-bone, known as the short ribs, are fastened only behind to the spine; they are very elastic and loose, and thus are called the floating ribs.

It is this enables any foolish woman to diminish the size of her waist to any standard fashion may demand.

All the breathing necessary to life can be performed by this part of the chest alone, as is generally the case during sleep.

When the pressure is made upon this part of the chest, then, as directed in *Rule 4*, the cavity of the chest is greatly diminished; what air is in it is partially forced out, and on suddenly letting go, the natural elasticity of these semi-cartilaginous ribs compels them to spring back to their natural position. This would create a vacuum, but that the fresh air is thus compelled to rush in through the mouth to occupy the otherwise vacant space.

This action, repeated as directed, compels successive volumes of fresh air to enter the chest just as occurs in natural breathing, and so it is called and constitutes "artificial breathing" or "artificial respiration."

The first returning natural gasps are apt to be irregular, and if the artificial breathing be continued regardless of them, the motions of the operator may actually interfere with and interrupt them; therefore, as directed in *Rule 5*, let your motions be so timed to the natural effort of the patient as simply to aid and deepen his breathing, which is as yet imperfect and insufficient.

With life comes heat, but the latter may be greatly favored by following the direction in *Rule 6*. *Warmth, rest, and fresh air* are now to be regarded as important means of completing the resuscitation already begun.

To make this chapter more complete, the following method of artificial respiration, known as Marshall Hall's, or the "Ready Method," is appended; it is described by its author as follows:

"Place the patient on his face, his arms under his head, that the tongue may fall forward, and leave entrance into the windpipe free, and that any fluids may flow out of the mouth; then

"Turn the body gradually but completely on the side and a little more, and then again upon the face alternately, to induce inspiration and expiration.

"When replaced, apply pressure along the back and ribs, and then remove it to induce further expiration and inspiration, and proceed as before.

"Let these measures be repeated gently, deliberately, but efficiently and perseveringly, sixteen times in the minute only."

#### HANGING AND SUFFOCATION.

*Hanging* induces death chiefly because the rope closes the

windpipe, and keeps fresh air from the lungs. *Suffocation*, whether caused by something covering the mouth, or by smoke, foul gas of wells, or other noxious vapors, causes death from the same cause equally, viz., by preventing fresh air from reaching the lungs.

In hanging, the first thing is instantly to cut and remove the cord.

Then proceed at once to perform artificial breathing, as directed in drowning, dispensing, of course, with the attempt to remove accumulations from the mouth or chest, and being careful to keep the head raised a little more than in the position after drowning, because in hanging the head becomes filled with blood, and this congestion is partly relieved by a more elevated position of the head.

In *suffocation*, proceed simply with the process for artificial breathing, just as for hanging.

#### STILL-BIRTH.

If the infant does not breathe immediately on coming into the world, be careful not to divide the navel-string for the present, because so long as that is complete the blood of the mother continues to nourish the child, just as it did in the womb. Wipe cleanly from its mouth and nostrils all mucus, and give it a smart slap with your open hand upon the belly. Dash upon its face sharply a little very cold water, then a little warm water, then a little cold water. If this does not succeed cut the cord, wrap the child in flannel, and proceed at once with artificial breathing, as for suffocation, but with this difference:—remember the infant has never once had any air enter its lungs, so there is none which by pressure can be displaced, therefore it is better to try and blow up its lungs first, and apply pressure afterwards; or let one person blow while another person makes the pressure for artificial breathing. In order to do this properly, wipe the nose and lips of the child very clean; open the mouth wide, by pressing your forefinger down upon the tongue and lower jaw. Let some one else press upon the larynx, or Adam's apple, as it is called, so as to keep it at the back part of the throat, and prevent any air from passing behind it into the stomach. Now apply your lips to the lips of the child, and steadily and forcibly blow, not quite emptying your own chest. Now let your assistant make the pressure, as described; then blow again, and so on, alternating the blowing and the pressure, in imitation of natural breathing; continuing the process, if necessary, for an entire hour, without intermission.

#### HEMORRHAGE FROM WOUNDS.

*Firm, steady pressure on the bleeding part* is the first treatment



for bleeding wounds in every case, and will usually be at once successful.

*Cold*—ice or ice-water—is very efficient when only small blood-vessels have been divided.

*Pressure above the wound, applied in the course of the artery*, is more reliable than either the other methods. In the arm or thigh this may be made and continued by tying a stone in a handkerchief, allowing the stone to rest right over the course of the artery, and then tighten it thereupon, by twisting the ends of the handkerchief around a stick, constituting a tourniquet sufficient to control the most violent hemorrhage, until the patient can be better cared for.

#### TREATMENT OF PERSONS STRUCK WITH LIGHTNING.

“When persons happen to be overtaken by a thunder storm, although they may not be terrified by lightning, yet they naturally wish for shelter from the rain which usually attends it, and therefore, if no house be at hand, generally take refuge under the nearest tree they can find. But in doing this they unknowingly expose themselves to a double danger; *first*, because, their clothes being thus kept dry, their bodies are rendered more liable to injury, the lightning often passing harmlessly over a body whose surface is wet; and, *secondly*, because a tree or any elevated object, instead of warding off, serves to attract and conduct the lightning, which, in its passage, frequently rends the trunks or branches, and kills any person or animal who happens to be close to it at the time. Instead of seeking protection, then, by retiring under the shelter of a tree, hay-rick, pillar, wall, or hedge, the person should either pursue his way to the nearest house, or get to a part of the road or field which has no object that can draw lightning towards it, and remain there until the storm has subsided.

“It is particularly dangerous to stand near leaden spouts or iron gates at such times; metals of all kinds have so strong a conducting power for lightning, as frequently to lead it out of the course which it would otherwise have taken.

“When in the house, avoid standing near the window, or door, or walls, during a thunder-gust. The nearer you are placed to the middle of a room the better.

“When a person is struck by lightning, strip the body and throw bucketsful of cold water over it for ten or fifteen minutes; let continued frictions and inflations of the lungs be also practised; let gentle shocks of electricity be made to pass through the chest, when

a skilful person can be procured to administer them; and apply blisters to the chest."

#### TREATMENT OF APPARENT DEATH FROM THE EFFECTS OF COLD.

The body should be brought into a room in which there is no fire, and rubbed with snow or cloths dipped in cold water. The frictions should be directed from the stomach towards the extremities. In a few minutes after, the temperature of the water should be very gradually increased, so as not to heat the body suddenly. Stimulants may be applied to the lips and nostrils.

The lungs must be inflated as in the treatment of the drowned. When the natural warmth of the body is returning, the patient should be put into a bed, wrapped in dry blankets, and be well rubbed with a flesh-brush. A little weak wine and water may be given, or a clyster administered containing a little wine or something slightly stimulative.

Strict diet should be adhered to for some time after recovery.

When the limbs only are frozen, the application of snow or wet cloths is to be confined to the affected parts; half a teaspoonful of hartshorn in a glass of water may be advantageously administered, or a little weak spirit and water.

#### CONVULSIONS IN CHILDREN.

In children there are two remarkable kinds of convulsions, namely, what are called inward fits, and the common violent convulsions. The inward fits occur generally during sleep, and are known by the corners of the mouth being drawn up into a sort of smile; the eyelids are open, and the eyes are usually turned up, so as to show the whites. There is a fluttering in the breathing, and the child frequently starts. Fits of this kind are generally relieved by a warm cordial medicine, such as a little aniseed or syrup of rue; appearing as they do to depend on wind and flatulence of the intestines.

As to the more violent convulsions, they depend on disorders of the nervous system, most usually brought about by the irritation dependent on teething. The symptoms by which such convulsions may be known are these:—There is spasm throughout the muscular system, the arms and legs are drawn up and agitated, the body drawn back, the eyes are either fixed in their sockets, or are rolled to and fro, the child grinds its teeth, and the countenance is distorted. Sometimes there is a sort of breathing, which resembles greatly the breathing in croup. The first thing to be done is to place the child in a warm bath, to which a handful of mustard or



salt may be advantageously added, and while in the bath to sprinkle cold water upon the head. A clyster should also be administered. After remaining some time in the bath, if the violence of the symptoms is but little mitigated, the child should be removed, and after being wiped dry, the spine should be rubbed with spirits, or hartshorn and oil, and mustard poultices applied to the feet. But whenever there is reason to believe that the convulsions are from teething, the gums should be immediately and freely lanced. A sharp pen-knife will serve perfectly well in this operation, which any one would be able to perform. At times, however, the child is weak and pale, and then, instead of applying leeches or bleeding, a little stimulant medicine should be given, containing two or three drops of laudanum.

When the child has recovered from the fit, it is usual to give a dose of calomel with a little rhubarb, in quantity proportioned to the age.

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### POISONING. . .

There are many different kinds of poisons. There is poison in the water we drink, and in which we bathe. But within certain limits, poisonous substances, when properly diluted, may be beneficial, and not injurious. There are poisonous ingredients in the ordinary articles of diet, and some of the best qualities of food contain the most powerful poisons. Flesh, fish, and wheat are the three most digestible and most nutritious of our common alimentary substances, and yet they contain phosphorus—one of the most virulent of poisons.

But beyond certain limits poisonous substances cannot be taken without injury.

*Carbonic acid* may be breathed for years in moderate doses; but in large quantities, as it is sometimes found in deep wells, it will prove instantly fatal.

Nearly all of our best medicines are poisons, some of them of the most virulent character. In small doses they benefit; in large doses they may work terrible mischief.

The same remarks will apply to stimulants and narcotics, all of which contain more or less poisonous substances. (See *Stimulants and Narcotics*.)

It is not necessary, in a treatise like the present, to enter into particulars relatively to the modes of action of the numerous descriptions of poisons to which the unfortunate who resolve on suicide have recourse, or to which such as are the victims of their own



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*The whole is based on the most Recent and the Highest Authorities, and brought down to the Latest Dates.*

By GEO. M. BEARD, A.M., M.D.

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ONE OF THE AUTHORS OF "THE MEDICAL USE OF ELECTRICITY," ETC.

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